NOTE

This Microfiche meets the quality requirements of the American National Standard for Microfiche of Documents (ANSI PH5.9-1975). However, because of imperfections in the document from which it was made, it contains images that are illegible or difficult to read. The source document for this microfiche is the best copy that could be obtained prior to filming.

Congressional Information Service, Inc
Washington, D.C.

CIS

96th Congress }
2d Session }
JOINT COMMITTEE PRINT

SPECIAL STUDY ON ECONOMIC CHANGE

STUDIES

PREPARED FOR THE USE OF THE

SPECIAL STUDY ON ECONOMIC CHANGE

OF THE

JOINT ECONOMIC COMMITTEE
CONGRESS OF THE UNITED STATES

DECEMBER 29, 1980

Printed for the use of the Joint Economic Committee

U.S. GOVERNMENT PRINTING OFFICE
99-271 O
WASHINGTON : 1980

J842-39

JOINT ECONOMIC COMMITTEE

(Created pursuant to sec. 5(a) of Public Law 304, 79th Cong.)

LLOYD BENTSEN, Texas, *Chairman*
RICHARD BOLLING, Missouri, *Vice Chairman*

SENATE	HOUSE OF REPRESENTATIVES
WILLIAM PROXMIRE, Wisconsin	HENRY S. REUSS, Wisconsin
ABRAHAM RIBICOFF, Connecticut	WILLIAM S. MOORHEAD, Pennsylvania
EDWARD M. KENNEDY, Massachusetts	LEE H. HAMILTON, Indiana
GEORGE McGOVERN, South Dakota	GILLIS W. LONG, Louisiana
PAUL S. SARBANES, Maryland	PARREN J. MITCHELL, Maryland
JACOB K. JAVITS, New York	CLARENCE J. BROWN, Ohio
WILLIAM V. ROTH, JR., Delaware	MARGARET M. HECKLER, Massachusetts
JAMES A. McCLURE, Idaho	JOHN H. ROUSSELOT, California
ROGER W. JEPSEN, Iowa	CHALMERS P. WYLIE, Ohio

JOHN M. ALBERTINE, *Executive Director*
LOUIS C. KRAUTHOFF II, *Assistant Director-Director, SSEC*
RICHARD F. KAUFMAN, *Assistant Director-General Counsel*
CHARLES H. BRADFORD, *Minority Counsel*

SPECIAL STUDY ON ECONOMIC CHANGE

LOUIS C. KRAUTHOFF II, *Director*
GEORGE D. KRUMBHAAR, Jr., *General Counsel*
DOUGLAS N. ROSS, *Senior Economist*
TIMOTHY P. ROTH, *Senior Economist*
RICHARD D. BARTEL, *Economist*

CONTENTS

Page

Human Resources and Demographics: Characteristics of People and Policy 1
Energy and Materials: A Shortage of Resources or Commitment? 49
Research and Innovation: Developing a Dynamic Economy 97
Stagflation: The Causes, Effects and Solutions 149
Government Regulation: Achieving Social and Economic Balance 199
Federal Finance: Government Dollars and American Affluence 243
State and Local Finance: Adjustment in a Changing Economy 295
Social Security and Pensions: Programs of Equity and Security 327
The International Economy: U.S. Role in a World Market:
    Book I 379
    Book II 419
Productivity: The Foundation of Growth 459

Human Resources & Demographics:

Characteristics of People and Policy

Joint Economic Committee

Special Study on Economic Change

A staff study

November 1980

(1)

The Joint Economic Committee's Special Study on Economic Change (SSEC) was inaugurated under the leadership of then Chairman Richard Bolling (D.-Mo.) and Vice Chairman Hubert H. Humphrey (D.-Minn.), together with Senator Jacob K. Javits (R.-N.Y.), ranking Minority Member.

The study progressed through Mr. Bolling's chairmanship and into the leadership of Senator Lloyd Bentsen (D.- Tex.), chairman; and Congressman Clarence J. Brown (R-Oh.), ranking Minority Member. The goal of the SSEC is to chart the major changes in the economy and to analyze their implications for policymakers.

Volumes of the Special Study on Economic Change

Human Resources and Demographics
Energy and Materials
Research and Innovation
Stagflation
Government Regulation
Federal Finance
State and Local Government
Social Security and Pensions
The International Economy
Productivity

JOINT ECONOMIC COMMITTEE

LLOYD BENTSEN, Texas, *Chairman*
RICHARD BOLLING, Missouri, *Vice Chairman*

SENATE

WILLIAM PROXMIRE, Wisconsin
ABRAHAM RIBICOFF, Connecticut
EDWARD M. KENNEDY, Massachusetts
GEORGE McGOVERN, South Dakota
PAUL S. SARBANES, Maryland
JACOB K. JAVITS, New York
WILLIAM V. ROTH, Jr., Delaware
JAMES A. McCLURE, Idaho
ROGER W. JEPSEN, Iowa

HOUSE OF REPRESENTATIVES

HENRY S. REUSS, Wisconsin
WILLIAM S. MOORHEAD, Pennsylvania
LEE H. HAMILTON, Indiana
GILLIS W. LONG, Louisiana
PARREN J. MITCHELL, Maryland
CLARENCE J. BROWN, Ohio
MARGARET M. HECKLER, Massachusetts
JOHN H. ROUSSELOT, California
CHALMERS P. WYLIE, Ohio

JOHN M. ALBERTINE, *Executive Director*
LOUIS C. KRAUTHOFF II, *Assistant Director-Director, SSEC*
RICHARD F. KAUFMAN, *Assistant Director-General Counsel*
CHARLES H. BRADFORD, *Minority Counsel*

Table of Contents

CHAIRMAN'S INTRODUCTION i
Senator Lloyd Bentsen

INTRODUCTION, RANKING MINORITY MEMBER iii
Rep. Clarence J. Brown

I. INTRODUCTION AND RECOMMENDATIONS 1

II. FERTILITY 9

III. POPULATION 11

IV. CHARACTERISTICS OF THE LABOR FORCE 13

V. STRUCTURE OF EMPLOYMENT 32

CHAIRMAN'S INTRODUCTION

Senator Lloyd M. Bentsen

Chairman, Joint Economic Committee

Through a combination of economic and demographic circumstances, America now has an opportunity to prepare for what could be the greatest long-term demonstration of productivity the world might ever witness.

The "baby boom" generation is maturing into prime age workers (25-45 years old). But their productive potential -- and the Nation's -- can be realized only if we adopt policies that make it possible to equip these workers with the best and most modern tools, technology and knowledge. If we fail to invest in the necessary quality and quantity of equipment and skills, the high expectations of American workers will be stymied as they are forced to compete for too few jobs in a stumbling economy.

With these prospects in mind, the Human Resources and Demographics staff study for the JEC's Special Study on Economic Change treats the Nation's foreseeable future not in cold, statistical terms -- as studies of demographics are prone to do -- but in human terms. When the numbers are sorted out, the message of this study is that it will take a strong economy to enable America to utilize its greatest asset -- its people.

Accompanying almost every statistic in the study is a current or future policy implication. For example:

- The tide of would-be workers entering the labor force will continue to grow during the 1980's by about 1.25 to 1.5 percent a year. During the 1970's about 19 million new workers -- mostly women and young people -- joined the employment rolls, which were more than the number of people added to the Nation's population. Policies that encourage investment in new plant and equipment will be necessary if people who want to work in coming years are to find stable, private sector jobs.

- As millions of Americans reach prime working age in the 1980's, they are expected to form households at a rate of nearly 1.8 million a year -- 300,000 more annually than in the 1970's and 800,000 more per year than in the 1960's. While a stronger economy would benefit all citizens, it will be especially necessary to those persons attempting to realize an American tradition, homeownership.
- Education institutions which now face dwindling enrollments have a fresh challenge. Continuing education can prepare adults for career changes or for maintaining and improving present career status. As technology alters the workplace, education can be one means of staying abreast of new discoveries and developments. Education and job training programs can best serve Americans if they are structured to lead to jobs in growth sectors of the economy.
- There are now five persons of working age to each person over the age of 65. By the year 2030, however, that ratio is expected to narrow to a one-to-three basis. Traditionally, current workers have helped to provide sound pensions for retired workers. If that bond between generations is to continue, policies must be adopted now that will provide workers with the new tools, technology and skills necessary to increase productivity.

During the 1980's improved cooperation among labor, business and government will be imperative if we are to make and implement policies to achieve the Nation's social and economic goals. A stagnant economy and high inflation obstruct job creation and improved living standards, as well as undermine the retirement income of millions of Americans.

We must encourage and include all human and capital resources in our efforts to realize America's productive potential. The alternative simply is not acceptable.

Ranking Minority Member's Introduction

CONGRESSMAN CLARENCE J. BROWN

The extraordinary potential of human resources in the United States, their rich diversity, skills and versatility are a critical determinant of American progress in the decade ahead. The Human Resources section of the Special Study on Economic Change clearly documents how changes in the size, composition and quality of American labor affected economic performance in the 1970's and elaborates the prospects for the 1980's.

Demographic changes will fundamentally alter the supply of human resources in the coming decade, according to the Human Resources research findings. The Post-World-War II baby boom, coupled with the much more active role of working women, brought a flood of over 22 million new entrants to the American labor market in the 1970's. That bulge, which exacerbated the unemployment problem of the past decade, will become a more mature, experienced and productive pool of workers in the coming decade. At the same time, the number of young people seeking work will decline substantially as a direct result of the drastic drop in birth rates in the 1970's. Thus, these age and quality characteristics of the labor force are expected to contribute favorably toward better productivity performance in the 1980's. Still, as this report indicates, we must count on continued, sizable growth in new job seekers, albeit at a substantially lower rate.

These prospects, then, underscore the need for Congress to adopt measures which stimulate capital formation, encourage technology change and innovation and to promote higher national saving to finance the necessary investment. These are the key prerequisites to better economic growth which will sustain our standard of living and enhance our competitiveness in the world economy.

Even with appropriate macroeconomic policies favoring accelerated investment and growth, the Nation's economy faces serious structural adjustments in major industries. The problems of the steel, auto and energy industries will present difficulties for many workers to overcome. In other cases, technology changes will lead to demands for new industrial skills. Meanwhile, the Nation's economy is growing increasingly oriented toward services -- which employ two-thirds of the Nation's labor force and were the source of nine out of ten new jobs during the 1970's.

Macroeconomic stimulus in the past has failed to alleviate unemployment stemming from structural change. Therefore, the Congress is challenged to strengthen, as this report urges, selective measures to attack structural unemployment. Targeted programs should be developed for retraining workers and locating jobs. Programs that emphasize the contribution of community-based organizations in locating, training and finding employment for the structurally unemployed must be expanded. Manpower programs should be coordinated with new capital formation to avoid bottlenecks of critical skills. Employer incentives, such as training subsidies, should be provided to meet unusual costs of hiring unskilled and inexperienced workers. As this report emphasizes, minority youth will continue in the 1980's to face severe unemployment problems. Targeted employment programs, then, will come directly to the aid of these workers who have suffered so disproportionately from stagflation and poor macroeconomic policies in the past.

This study correctly recognizes the key role of millions of small businesses as the historical backbone of growth in private sector employment in the United States. Congress should press ahead with better measures to stimulate investment and job creation in grassroots business.

One important demographic finding bears on U.S. defense posture as well as on economic performance. As the pool of young people shrinks in the 1980's, military recruiters will have to compete with private sector employers to fill the armed forces manpower requirements. Congress will have to review seriously military pay and benefits relative to remuneration in the private sector if high quality, voluntary armed forces are to be maintained over the long term.

HUMAN RESOURCES AND DEMOGRAPHICS:

Characteristics of People and Policy

I

INTRODUCTION AND RECOMMENDATIONS

Human, physical and natural resources will be altered in the decades ahead in response to a number of influences. Rising energy prices, new technology, changing consumer tastes, shifting terms of trade and increasing international competition will create imbalances in a rapidly changing labor market that will entail considerable adjustment by workers, industry and government.

Through all this, policymakers should remember that optimum utilization of human resources is vital to the economic future of the United States and to the individuals who compose the human resources pool. An improved standard of living and increased quality of life can best be realized through the most efficient use of all resources.

Additionally, human resources -- combined with long-term investment in physical resources and beneficial use of raw material -- can help the United States meet the challenges of changing economic developments.

The period 1980 to 2000 will require cooperation among labor, business and government in the development of policies that build consciously toward a healthy, competitive and efficient productive structure. Policy implications drawn from shifting demographics and modifying values of life are aimed as much at private industry as at opportunities for government solution. Therefore, implications of this section are as much for the consideration of the private sector as they are for the public sector. Government, labor and business each has a role for contribution.

It is imperative that America's vision -- from the corporate boardroom to the cloakrooms of Congress -- shift toward a long-term, anticipatory framework, rather than a short-term, reactive one. Central to this approach are measures aimed at raising the productive potential of the United States. A stagnant economy and high inflation rates are the major obstacles to the full employment policies that are the best hope of millions of Americans who are currently unemployed or underemployed -- many for reasons beyond their control. Strong economic growth will help create the jobs needed over the long run to provide employment opportunities for those willing and able to work.

Energy prices have increased dramatically and the United States is now importing more goods than it exports -- both factors which have contributed to rising inflation. Tax and regulatory policies of the United States, too, have aggravated the problem by discouraging productive investment. As energy and production costs have gone up, labor has been substituted for energy and for physical capital -- at the expense of investing in new plant and equipment for the long term. Lack of investment in plant and equipment leads to inefficient use of resources.

Human resources -- as with plant and equipment -- can be inefficiently utilized, or not used at all. The amount of goods and services produced will not be as great as it could be unless human resources, along with physical and natural resources, are fully utilized. Therefore, the attained gross national product of the United States will be less than the potential GNP unless specific goals are successful.

- Educational programs should be geared to meet the needs of a changing society. Goals should be:

1. To reduce illiteracy and increase the opportunities to acquire basic skills.
2. To structure college education programs so they will prepare students for entry into the labor market and for multiple careers during a lifetime.
3. To provide vocational programs which match skills and training to the needs of the workworld. College education will continue to be important in coming decades, but evidence suggests there will be serious needs for persons with skills requiring alternatives to formal arts and sciences education.
4. To expand intern programs to give students in college and vocational programs opportunities for actual experience in work situations. Students often find that jobs do not meet their classroom expectations -- many times resulting in waste of the preparation years, another inefficient use of human resources.

- Efforts need to be directed toward ending discrimination which still limits both educational and employment opportunities for minorities, women, handicapped and older workers.
- Underlying issues which result in minority unemployment should be addressed. These issues include inadequate basic education, training and employment needs, and other labor market difficulties.
- The public and private sectors should support efforts to broaden occupational choices for women and to encourage their entry into less traditional fields.
- Policies should be aimed at assisting in the adjustment of workers displaced because of technological change or international

competition. These policies should be directed toward retraining and reemployment in growth sectors, rather than exclusively as supplementary unemployment insurance.

This policy implication is not to suggest that policy directed at retraining and reemployment in the growth sectors is the only course. It is to suggest, however, that policy should concentrate on, and emphasize, the merits of a national goal to best utilize resources in the growth sectors and to improve national productivity performance.

The labor force of the United States is expected to grow at an annual rate of 1.25 to 1.5 percent during the 1980's with labor force growth slowing to less than one percent during the 1990's. All workers, however, are not expected to be fortunate enough to find themselves in the growth industries of the immediate and long-term future. Rapid changes are anticipated in technology and in the composition of international trade. Some of America's workers will be affected more than others by the resulting shifts in particular industries. The changing terms of trade, rapid dissemination of technical knowledge, lack of market response by corporate executives, foreign government subsidization of their domestic industries and unintended consequences of tax and regulatory policies already have led to a decline in some industries. These forces are likely to continue in coming years and probably will accelerate in some instances.

Various kinds of assistance may be appropriate responses for some affected industries -- particularly for those in decline which are important for national security reasons and for those facing competition which U.S. national policy judges to be unfair. Protection and subsidies, however, can prove counterproductive for other affected industries. Protection only delays the inevitable if the decline in the industry is attributed to changing consumer tastes, input prices or perpetuation of obsolete and inefficient production techniques. To allow industries to decline, however, would impose costs on the industries' workers, management, owners, and the national economy.

The Federal Government can reduce the impact of declining industries on the United States and its human resources by expanding current adjustment assistance programs. The emphasis of the programs should be on retraining and reemployment of displaced workers and on financing assistance to companies.

Some labor management agreements have moved already in the direction of adjustment assistance for their workers; some contracts give workers the right to bid on jobs in other plants of the company in the event of an extended layoff or a plant closing. In various instances, this right is accompanied by help with moving expenses for such relocation. Certain companies also provide tuition aid programs for upgrading worker knowledge and skills.

An effective adjustment assistance program should encompass more than the retraining and re-education process. It needs to be complemented by a strong linkage system between labor market demand -- which is governed by changing technology and product market conditions -- and the skills and knowledge that workers obtain through specialized manpower programs.

A strong adjustment policy would recognize that instantaneous adjustments are impossible. This is because both the retraining process and market conditions affecting industries' requirements for labor go through long-term stages of development and change.

For these reasons, efforts to best utilize human capital require a system which -- so far as possible -- anticipates technological and product market changes. A perfect system which anticipates all problem areas cannot be expected. However, a system which waits for problems to reach the point of no return before responding to them is not acceptable -- both because of economic losses and human suffering caused by unemployment.

Policy will always have to remain flexible in order to respond, even in hindsight, to unpredicted problems of a troubled industry. While realizing that, however, the better course is an overall strategy which looks beyond the short-term horizon toward an understanding of unfolding technology and market conditions, and which integrates job training and other programs. To design such a strategy, Congress should designate an agency to work with representatives from business, labor, academic institutions and government:

- To produce appropriate technology and market forecasts. These forecasts would be used to design specific policy proposals.
- To determine -- to the extent possible -- the impact of technology and market developments on industrial growth prospects for use in forming sectoral policies.
- To determine -- to the extent possible -- what kinds of training and retraining needs will develop in the future in order to assist workers who face potential displacement because of shifts in particular industries.

At the same time America seeks to improve the *use* of its human resources, the future will require innovative means to assist in the *development* of human capital. Possibilities include:

- Broad scale development of childcare facilities whether through efforts of the public or the private sector -- or a cooperative combination. Working mothers, numbering between 7 and 8 million in 1990, are expected to have 10 to 11 million children under age six -- youngsters who will need child care while their mothers work. Estimates are that there will be 34 million children in the school-age bracket of kindergarten through grade eight in 1990, and many of their mothers will work. Working women are encountering increasing problems in the childcare area and the trends in lifestyles and custody cases indicate it may be men as well as women who face the childcare problem in the future more than in the past and present.

- Consideration of changes in the current military recruiting system. Lower fertility rates will result in the future in reduced numbers of young males, the group from which the military traditionally draws its new members. As the pool of young people shrinks, consideration may turn to options of how to divide resources between military and civilian uses -- ranging from a totally voluntary military effort to mandatory service. Under the current system of the U.S. military, several groups of young people are not considered qualified and available for service. For example, from a 1990 pool of 10.6 million 17-22 age males, about 4.6 million will be considered not available for service because they will be in college. Another group of young people -- females -- has not been utilized extensively by the military. Improved pay scales, greater opportunities for promotion and restructured retirement plans could encourage more and longer attachments to the service. Demographics may mandate changes in thinking on this issue.

- Incentives to induce older workers to remain on the job. As the pool of younger workers decreases in size, older workers may play an even more vital role in the U.S. economy. To benefit from the experience and skills of this increasingly larger segment of the population, less stringent Social Security and pension restrictions may be necessary. Other options available for retention of older workers include delayed or phased in retirement, more flexible work schedules and personnel policies which consider the older worker.

- Development of a preventative health maintenance program to increase the contributions which human resources can make. With the advances already made in the cure of specific diseases and illnesses, attention in the future could focus in the preventative area. Investments in preventative health care could prolong the contributions of all individuals, regardless of age.

- Review of the Social Security law. The law was designed when most American women were lifelong homemakers. Over half the U.S. women presently work outside the home and their numbers are expected to increase. Social Security benefits under current law are not as favorable to the family where both the husband and wife work as they are to the one-earner family. Planning now can set the stage for long-range changes in the law to better reflect lifestyle shifts in America. Long-term revisions should not disrupt the retirement plans of millions of people whose expectations are based on the present system.

- Consideration of income tax law changes. Under present law, marriage increases the tax bill for many couples when both spouses work. Although more women work outside the home than ever before in American history, there is some evidence that this marriage penalty discourages some women from working altogether and reduces the number of hours worked for others. Because lower fertility rates are expected to produce fewer prospective workers, women may become even more important to the labor force of the future. The removal of marriage penalties in the income tax law could maximize benefits from this pool of human resources.

Policymakers will have to determine which issues merit priority for the future -- issues ranging from child care, older workers, Social Security law, military recruiting, income tax provisions to preventative health care. However, decisions on programs for minorities and education appear to be more imminent.

Minorities -- particularly minority youths -- will continue to face unemployment and labor market difficulties over the coming decade, unless steps are taken to meet their special needs. As a result of inadequate basic education, poor or non-existent job skills and discrimination, large numbers in this group have characteristics that generally fail to mesh with the needs of private and public employers. A multi-faceted and coordinated approach will be needed if a successful attack is to be waged against minority -- and other structural -- unemployment.

- First, training and employment programs -- such as those enacted by Congress over the last decade -- will continue to be important in the 1980's. Careful targeting will be necessary to provide assistance to those who need help the most. Youth programs should be integrated where appropriate into the high school education system so that a stronger bridge might be built between the classroom and the job market. Such a program would provide opportunities for significant job training on a part-time basis in local plants, stores, offices and other service establishments. So that job training would not replace, but rather supplement, essential aspects of high school learning, students opting for job training should also be required to continue with the basic elements of the conventional educational curriculum. To complement job training programs -- whether for youth or older workers -- specialized counseling should be developed to ensure that what has been learned will not be wasted and that workers are directed toward available jobs with long-term productive potential.

- Second, manpower programs must be coordinated with new initiatives to increase capital formation, for without suitable jobs in the private sector, training programs will be of only minimal value in terms of long-term, productive employment.
- Third, incentives such as employment tax credits should be continued and, if necessary, expanded to help employers meet any unusual cost of hiring less than fully experienced and productive workers. By placing the primary responsibility for training on employers, the approach offers a direct way of assuring that skill development is matched to available jobs.
- Fourth, since small businesses have historically been the backbone of private sector employment growth, special measures to spur growth in this sector should be considered. Improving the ability of small business to obtain capital for growth and innovation would help open entry level job opportunities -- which are especially important for minority youths -- as well as skilled jobs for older workers.
- Finally, policies which are designed to achieve strong economic growth and expanded employment opportunities for the economy as a whole must be pursued. Evidence has shown that minority unemployment falls more rapidly than white unemployment in times of economic growth. According to a study by the National Commission for Employment Policy, a one percent reduction in the national unemployment rate will reduce the black unemployment rate by 1.26 percent compared to only .99 of a percent for whites. This evidence indicates that sustained economic growth can do much to lessen the discrepancies between the different racial groups in this country in their employment opportunities.

The changing employment market over the next two decades will require from virtually every job seeker competency in basic education, and attention to job-related skills that enable employees to adapt to shifting employment patterns and employment opportunities. Other forms of continuing education, particularly in professions like medicine and law, will likely receive increased emphasis for some time to come.

Should enrollments decline as expected and costs continue to rise, many colleges and universities may be forced to alter their admissions policies. These institutions may have to follow the lead of community colleges which now focus a significant portion of their recruiting on adults returning to school either for self-fulfillment, continuing professional education, to develop increasingly complex skills or for more formal re-education in preparation for career change or enhancement.

The business community may also prove to be a force in what seems to be a growing movement to increased re-education or continuing education as it relates to the workworld. A number of companies have instituted some form of tuition-aid programs under which the company assists or pays education costs for employees. While the response rate on the part of employees has been rather low, limited evidence indicates that if these companies were to promote education programs more aggressively, a greater percentage of employees would participate.

Lower level education, too, will confront problems arising from demographic change and shifting educational needs. At the elementary and secondary level, expected enrollment decreases suggest that the fate of underutilized and empty schools will continue to be an issue in the 1980's. A variety of alternatives to school closings exists which would allow local officials to retain a measure of control over their options should the school age population rise again in the future. Alternatives include conversion to or leasing arrangements with:

- Other governmental entities.
- Centers designed to assist senior citizens or groups requiring special services.
- Vocational training facilities.
- Preschools, day-care facilities and adult education centers.

With the dramatic increase in the number of working mothers and the growing recognition of the importance of intellectual and social development during a child's early years, pressures for the extension of public education to the preschool level will likely increase in the 1980's.

While some of these developments clearly pose problems for educational institutions, others may present opportunities for creative solutions which can benefit both the educational system and the community. As the Nation faces rapid changes in technology and international trade, it will become increasingly important to fully develop and utilize the capabilities and talents of the population. Education will be a key to success in this effort.

The following analysis of changing demographics reflects how lower birth rates, slower population growth and the aging of the American society will likely characterize the 1980's in the United States.

Recognition of the changes should enable government, business and labor to anticipate the problems with greater clarity, and to devise effective solutions.

II
FERTILITY

American women gave birth to half as many babies in the late 1970's as they did during the peak of the baby boom years in the late 1950's.

At the crest of the baby boom (1946 through 1964), the fertility rate reached a high of almost 3.8 births per woman. In contrast, the fertility rate fell to 1.8 births per woman during the 1970's -- the lowest rate in America's history -- resulting in a dramatic decrease in natural population growth. (The fertility rate is a measure of the number of children an average woman will bear in her lifetime.)

During the 1946-64 period, there were 76 million live births. In 10 of those years, 1955-64, there were over 4 million births each year. The surge of post-World War II infants brought changes in social, economic and political factors in the United States. The boom babies will dominate the 1990 labor force as middle-aged adults and then in the twenty-first century -- as they become the aging group -- the postwar children will have a marked impact on retirement programs. Even as the fertility rate of 20 years ago continues to have far-reaching effects on the present world, the fertility rate over the next two decades will bring significant developments in the next century.

The fertility rate is a critical element in population and labor force projections. For a stabilized population, a fertility rate of 2.1 births per woman is necessary. With the 1.8 fertility rate of the 1970's, the United States has been below the 2.1 replacement level since 1972.

The Bureau of the Census has prepared population projections based on three fertility rates. The three projections are distinguished as Series I, Series II and Series III. Series I is based on a high fertility rate: the assumption that the average woman will have 2.7 babies during her childbearing years. Series II assumes a replacement level fertility rate of 2.1 births per woman. In Series III, the fertility rate is 1.7 births per woman in the childbearing age group.

The fertility rate in the United States has not been as high as 2.7 since 1966. In 1972, the rate declined to 2.0 births per woman -- below replacement level. Since that time, the rate has been about 1.8 births.

Several reasons may be offered for the reduced fertility rate, but it is believed a major factor is the changing role of women in the United States, especially in the workworld. The 1970's saw massive numbers of females enter the labor force, a trend that should continue through the 1980's. This labor force participation is a prime argument against any near-future increase in birth rates. In addition, there has been a steady decline in the proportion of women marrying by age 24, women are having their first child at a later age, and women's investment in higher education is increasing -- all contributing factors to maintenance of a steady fertility rate. The growth of two-earner families -- partly caused by inflation -- further reinforces the belief that the lower fertility rate will likely continue -- at a level of about 1.9 births per woman for the next 20 years.

Both high and low birth rates have positive and negative effects. Members of the baby boom generation illustrate this. They crowded maternity wards, schools and colleges; they crowded the labor force, raising the unemployment rate for young people. During its middle years, this group will increase the work experience level of the labor force -- a factor which could cause productivity improvement -- and should cause more rapid household formations which would boost the economy.

With a low birth rate, existing schools would not be filled, but for most teenage groups unemployment is expected to ease because there will be less competition for entry level positions. However, in the second quarter of the twenty-first century, retirement programs could encounter problems as projections show only three persons of working age to each person over 65 years old, compared to the current five to one ratio. While program costs for the older segment of the dependent population will increase, support costs for the young dependent group should decrease as that portion of the population declines in size.

III
POPULATION

There are two ways in which to add to the total population of the United States -- through natural increase (the difference between the number of persons born and the number who die) and through net immigration. During the 1970's, nearly one out of four persons in the United States was added to the population by legal immigration.

An average of 1.8 million persons annually expanded the U.S. population during the 1970's for a 10-year gain of 17.9 million people. The population increase for the decade amounted to 8.8 percent. By the end of 1979, the population approached 222 million, compared to about 204 million people in 1969. In contrast, population during the 1960's grew 14 percent at a rate of 2.5 million per year -- 700,000 a year more than in the 1970's.

The United States currently admits about 430,000 legal immigrants annually, although larger numbers may be allowed entry through Presidential order. In one year, fiscal 1978, there were 601,442 legal immigrants who entered the country, but in 1979 the number of legal immigrants was 460,348. In contrast to the large flow of immigrants to the United States, about 35,000 citizens leave the country in a year, according to Census Bureau estimates.

Assuming in the 1980's an immigration rate of 400,000 persons a year and a fertility rate of 1.9 births per woman, the 1990 population would be about 240 million, an increase of 8.7 percent during the 10 years. During the 1990's, population growth under this scenario would drop to about one-half percent per year to reach a 2000 population of about 253 million, a 5.5 percent gain for the decade.

If population growth continues to slow, as expected, the relationship of specific age groups to the total population will change -- with the demographic shifts imposing their traits on work and lifestyles. In the United States in 1990, it is expected that:

- One third of the population will be ages 25-44.
- The median age will be 33 years, compared to 30 in 1979.
- About 60 percent of adult women will work or want to work; between half to two-thirds of the new entrants into the labor force will be women.
- One in five persons will be black or Hispanic -- although the minority labor force share will remain at about 12 or 13 percent.
- Twenty-five percent of the population will be under age 17; and 12 percent will be age 65 and over.

While structural shifts in the United States population over the next 20 years give promise to the continuation of stable government, the same cannot be said for rapid population growth projected to occur elsewhere around the globe -- especially in the large urban centers of developing countries, where massive urban crowding is anticipated. The largest urban centers in developing countries are expected to grow almost seven times faster than their counterparts in developed countries, including the United States.

It is anticipated that the largest urban centers in developing countries (centers with more than 5 million people in 1980) will absorb 91 percent increases in population by 2000. The United Nations projects the 17 largest will contain almost 281 million by 2000, roughly double their present estimated size. Mexico City, for example, is projected to grow from 15 million to 31 million over this period.

By comparison, the population of the developed countries' largest centers (those with 5 million or more people in 1980) is expected to increase only gradually. America's largest urban centers (New York, Los Angeles-Long Beach, Chicago, Detroit and Philadelphia) with an estimated 49.8 million people in 1980, are projected to expand to 56.6 million by 2000, a 14 percent increase.

IV
CHARACTERISTICS OF THE LABOR FORCE

Shifts in fertility rates have dramatic consequences on the composition of the labor force.

Nearly one out of three persons living in this country in 1990 is likely to be between the ages of 25 and 44 -- products of America's baby boom. Because of their numbers, these citizens have had an impact on life in the United States since they were born. As the group ages, it continues to leave its mark on America -- and to shape its future. The postwar youngsters are expected to continue to draw much of government's attention through the coming decade.

This generation has already greatly affected schools, youth unemployment, delinquency, teenage markets, colleges and suburban sprawl -- including household formation and installment credit. With work experience in hand, this group is expected to have major influence on companies, unions, consumer markets, politics and public policies.

The median age of the United States population -- 30 in 1979 -- will be 33 in 1990 and will rise to 36 in 2000. The notable factor in the coming decades will be the maturing of the society. Whereas attention in the two prior decades centered on young people, in the 1980's much of it will turn to the 35-45 age group and in the 1990's will likely focus on the 45-55 age group.

Labor Force Size

Both the civilian labor force and civilian employment expanded more during the 1970's than the total United States population -- which increased 17.9 million persons.

The civilian labor force grew by 22.4 million persons from 1970 to 1980, a 27.5 percent increase. As the 1980's began, there were 104 million persons in the civilian labor force which expanded at the rate of 2.45 percent a year during the 1970's. The 1960's labor force had increased 1.7 percent a year.

Civilian employment ranks swelled with 19.1 million additional workers employed from 1970 to 1980. Employment grew at an annual rate of 2.25 percent, totaling 24.3 percent for the 10 year span. The employment gains came during a decade when the country experienced its worst recession (1974-75) since the 1930's.

Women and young people captured most of the employment gains. Of the 19 million new jobs created during the 1970's, 11.5 million were filled by women. One-third of the newly employed were young people, ages 16-25. At the end of 1979, women accounted for 42 percent of the labor force. About 52 percent of the labor force was under age 35.

Projections for future labor force growth are precarious because the total outcome depends on individual decisions made by millions of people. Factors include the female role in the workplace; choices of young people about college, work or military; extension of the worklife for older groups; immigration; and the state of the economy.

The 1970's growth is likely to spill over into the first half of the 1980's with a substantial slowdown anticipated by 1990. Expansion during the 1990's probably will be reduced from the 1980's growth.

The Bureau of Labor Statistics details three possibilities for labor force growth in the next decades. BLS makes predictions based on low, intermediate and high economic growth. Among other factors, the projections are based on an assumption that the number of legal immigrants entering the United States each year will average about 400,000. The low growth prospect is not likely to occur since that prognosis places 114 million persons in the labor force by 1990 -- and there were already 104 million by the end of 1979.

The intermediate forecast of BLS anticipates 119 million people will be in the labor force by 1990, a gain of 14 percent for the decade at a rate of 1.3 percent a year. A high growth rate foresees 126 million persons in the 1990 labor force -- a growth of 21 percent for the decade at 1.9 percent annually.

The year 2000 labor force would total 125 million people in the intermediate economic forecasts of BLS. Under this scenario, the 1990's would experience labor force growth of 4.9 percent -- less than half a percent a year. The high growth rate, as projected by BLS, would place 135 million people in the 2000 labor force -- a growth of 7.2 percent for the decade at .7 percent each year.

The actual path of labor force growth has often diverged considerably from the projections. During the 1970's, for example, women entered the labor force in huge numbers -- a trend which was not projected by forecasters.

Fifty-two percent of working age women were in the labor force in late 1979, compared to 43 percent participation in 1970. The intermediate growth projections of BLS expect this female participation rate to rise to 57 percent by 1990; the high growth scenario calls for a 60 percent women's participation rate by 1990.

More surprising than the failure to detect the surge of women into the labor force, however, were the inaccurate predictions about the entry of young workers into the labor force; surprising because the baby boom which created the labor force flood had already occurred. The 1966 Manpower Report of the President for example, projected an additon of 14.8 million workers under age 35 to the labor force between 1960 and 1975, while an increase of 19 million actually took place.

Participation rates for men dropped from 78.8 percent in late 1969 to 77.6 percent in December 1979. Young male workers (ages 16-19) increased their participation rates from 51.2 percent to 58.4 percent over the period. Early retirement accounted for the decline in participation rates of male workers over 55. More than 83 percent of the males age 55-64 were in the labor force at the end of 1969, compared to 72 percent a decade later.

The likely scenario suggests that an intermediate labor force growth rate in the range of 1.25 to 1.5 percent is anticipated for the 1980's. Lower birth rates have created smaller pools of workers for the future, but expansion of the labor force is likely to develop because of lifestyle trends which include multiple wage earners in one family; growing numbers of households headed by divorced, widowed, or never-married persons; and women's changed -- and still changing -- role in the workworld. The rise in the level of work experience and education of minorities and women will influence the size of any future labor force as will continued support of equal employment opportunity provisions.

Moderate growth in the next decade would lead to a 1990 labor force of roughly 120 million. The likely scenario is that labor force growth in the 1990's will result in a 2000 labor force in the range of 130 million people. Growth for the 1990's would be less than one percent a year. Factors which tend to support the 1990's growth include the increased number of women who already would be in the labor force and attempts to encourage older workers to remain in the labor force.

Young Workers

Young workers, ages 16-24, crowded the labor force during the 1970's and their numbers sent youth unemployment rates spiraling. Thus, the high fertility rates of the baby boom years had exerted its first impact on the labor force.

Gains in employment of young people were recorded as this segment increased its number of workers by 42 percent during the 1970's. At the same time, however, youth unemployment rose by 106 percent; and while all teenage unemployment rates were high, they were especially so for minority youths. The average unemployment rate for all minority teenagers was 34.3 percent in late 1979, compared to a 13.9 percent unemployment rate for white youths. Although some unemployment is expected, the process of successfully entering the labor market clearly has more obstacles for minority youths than for whites.

For young people who could find work, wages were lower relative to those for older workers. With the sizable influx of workers, employers were in a position to hold down wage rates.

In addition to the impact on the labor force, this age group affected college circles as young people attended college in increasingly larger numbers. College enrollment climbed steadily during the 1970's. In 1969, there were 8 million people enrolled in college compared to 1979 when 11.7 million registered for college.

The decline of the fertility rate, beginning in the late 1960's, will result in a decrease in the number of young workers in the 1980's. The proportion of the labor force in the 16-24 year bracket will decrease by about 8 percent to reflect an absolute drop of nearly 2 million people by 1990.

As the 1970's began, there were 17.1 million people ages 16-24 in the labor force. This segment grew to 24.3 million persons by 1980, a 42 percent increase over the decade. A decline of close to 8 percent will reduce the 16-24 age section of the labor force to around 22 million by 1990 and another loss of 9 percent will place 20 million 16-24 in the 2000 labor force.

This coming scarcity of youth -- scarce when compared with the huge supply in past years -- should help ease youth unemployment. The reduced numbers of young workers could have positive influence for lesser skilled and initial entry jobs -- both classifications generally reserved for younger workers.

Minority young people, however, may not experience much improvement in unemployment. Even as the total number of persons (16-24) in the labor force drops, the proportion of minority members in the young category will increase. The total number of persons in this segment will dip nearly 2 million by 1990, but there will be about 3 million minority youths in the 1990 labor force -- slightly over the number of minority youth as in the labor force in late 1979. This means minority youth will increase its share in the 16-24 age section of the labor force. These statistics reflect less decline in the fertility rate for minorities than for whites. Unless targeted programs are geared to their specific needs, high unemployment rates for minorities will persist throughout the 1980's.

Lower birth rates produce a smaller pool of young people -- for entry into the labor force, college and military service. As the 1980's began, there was an average of 12.5 million males in the 17-22 age group which is expected to decline to 10.6 million in 1990. The 17-22 male group is singled out for this discussion because more than 99 percent of the volunteers for the military come from this segment of the population. As the military services are forced to compete with civilian opportunities for a shrinking number of young people, military recruiting will become increasingly difficult.

In 1977, the Brookings Institution published a study on the military pool. According to study data, there were 3.8 million males qualified and available for military service in 1977, but the number is expected to drop to 3 million by 1990, a decline of 21 percent. Of the 1990 pool of 10.6 million, the study eliminates 4.6 million because of anticipated college enrollment. This study also eliminated from the projected available pool a number of young males who were likely to be institutionalized, in the military, unqualified for mental, physical or moral reasons, or were already likely to be veterans by then.

In 1977, one out of 11 of the 3.8 million males in the military pool needed to volunteer in order to meet the recruitment goal of 365,000 men per year. In 1990, one of eight in the military pool must volunteer to sustain the same goal, or other initiatives will have to be taken. Improved pay scales, greater opportunities for promotion and restructured retirement plans could encourage more and longer attachments to the service. Other options include the return of the draft to meet military demands, programs to retain those who have served their assigned tours of duty, and those who have qualified for retirement, or the recruitment of more female personnel.

Greater numbers of women in the armed services would help offset the reduction in the pool from which military personnel currently are drawn. Women's representation in the armed forces grew from less than 2 percent to 7 percent during the 1970's. The current goal of the armed forces is to increase the share of women on active duty to 11.5 percent by 1984. Two factors suggest that large numbers of qualified women might be attracted to military service: First, the available supply of female high school graduates of average or above average intelligence is barely being utilized by the military; and second, sex discrimination is not a factor in military pay as it frequently is in civilian pay.

Prime-Age Workers

By 1990, about one out of two persons in the labor force will be in the prime-age component of the labor force, ages 25-44. This group will expand from 47.6 million at the beginning of 1980 to an anticipated 65 million in 1990, an increase of 36 percent.

The declining birth rate and aging population could create a bulge in the middle-age layers of population and, thus, the labor force. Society will age with this critical group, and in 2000 about half the workforce should be 35-55 years.

At the beginning of 1970, the 25-44 age group accounted for 40.4 percent of the labor force, compared to 45.8 percent by 1980. This middle group is expected to increase its share to over 54 percent of the labor force by 1990, declining to about 51 percent by 2000.

Typically, the 25-44 age range includes years of high productivity when employees increase skills and work experience. The abundance of prime-age workers during the 1980's could form the basis for substantial improvements in the Nation's rate of economic growth although this will not diminish America's need to modernize its capital equipment. The large numbers of working-age persons, at least through the turn of the century, will strengthen the country's ability to provide for its non-working population as well. The prime-age years are also generally productive for workers individually because unemployment rates for this segment are low.

Workers in this category, however, will be in competition for promotion and supervisory positions. Competition is expected to intensify and numerous policy decisions wil' likely center on this group in the 1980's as the middle group clusters at mid-career. Based on past confrontations of this group about issues of prior decades, it is likely these workers will utilize innovative ways to resolve employment conflicts. The relative decline in opportunity for the prime-age cohort could lead to increasing unionization.

These are the same people who competed for their places in college and now the group will encounter rivalry from within its own ranks during its entire working life unless government and marketplace efforts can open wider employment and upper level opportunities of the future. Because of the size of the group, the workers may not obtain income gains as high as the pay increases generally associated with more work experience. With a lower birth rate and a smaller group of incoming labor, there would be less workers for the prime-age groups to supervise -- resulting in fewer promotion opportunities. Future developments in technology, however, could result in more automation in the workplace -- automation for which more supervisory personnel would be needed.

As consumers, this group should provide continuing strong prospects for household formation and durables during the 1980's. The youngest of the baby boom will reach household formation stage during the next decade. This fact, linked with trends toward two-earner families and the number of single persons setting up households, should reinforce housing markets. Household formation during the 1980's is expected to average nearly 1.8 million a year -- up from the 1.5 million households started each year during the 1970's. During the 1960's, households were created at a rate of 1 million a year.

For the millions of Americans who will be in prime age during the 1980's and at the household formation stage, improvement of the economy is critical to their realization of the American dream of home ownership. The 1978 median price for a new home in the United States was $55,600 compared to $25,600 in 1969. The 1978 median family income was $17,640 compared to the 1969 median income of $9,433. The price of a new home has risen 117 percent since 1969 in contrast to the 87 percent increase in family income during the same period. Economic improvements -- reduced inflation, increased productivity, increased real earnings and improved competition -- will be especially vital to this huge segment of the population. Unless economic opportunities improve, this age group will not be so tolerant of government policy which erodes the standard of living.

Older Workers

The 65-plus population of the United States is currently growing at a rate twice that of the general population.

With fewer babies being born to provide balance to the population distribution, the middle-aged and older segments will continue to expand. Under present trends, by the year 2000, the population of the United States will have more than tripled during the century, but those over age 65 will have increased 10 times.

The entry of fewer workers into the labor force because of lower birth rates and the tendency of many workers to select early retirement may lead to development of new work life patterns for older persons. Into the twenty-first century, employers are expected to be more motivated to recruit and retain older workers than ever before.

People over 65 years old comprised 9.8 percent of the population in 1969, compared to 11.1 percent in 1979. It is anticipated that in 1990 this group will make up about 12 percent of the population and its share will inch to slightly over 12 percent by 2000.

It is after 2010, when the baby boom generation begins to retire, that the elderly will likely cause the dependency ratio to worsen if present trends in retirement, pensions, health care, etc. continue. There are now five persons of working age to each person over age 65. The ratio could decline to three working age persons for each person over 65 by 2030. It is the working age population whose taxes finance Social Security, Medicare and other Federal programs for the elderly -- programs which now account for one-fourth of the Federal budget. If present policies are maintained, expenditures for aging programs will constitute 40 percent of the Federal outlay early in the next century.

A person who reaches age 65 can expect to live an average of another 16 years -- to age 81. There are currently 5.1 million people who are 80 years or older; in 2000 there will be roughly 8 million who are 80 or older. This outlook, combined with improvements in the health of older persons and demographic factors, may force a rethinking of what age is "old".

At issue in the future is whether work rates for the older group will continue to decline, stabilize or increase.

The participation rates of older workers -- particularly men -- have declined substantially. At the start of 1970, 83 percent of the men age 55-64 were in the labor force. By the beginning of 1980, 72 percent worked or were available to work.

The mandatory retirement age for the private sector was raised recently from 65 to 70. Mandatory retirement from the Federal Government was eliminated completley. These changes are certain to have an impact on the workplace, but it is too early to assess the influence on the current labor force. The excess of middle-aged workers may give employers less reason to encourage older persons to work until after 2000 when the labor force resources begin to falter. Employers then probably will offer older productive workers incentives to stay.

Another factor in retirement for persons who draw Social Security has been that program's policy on earned income of Social Security recipients. Beginning in 1980, recipients over age 65 may earn $5,000 without penalty; however, earnings over $5,000 are reduced by a ratio of $1 in Social Security benefits for each $2 in earnings. This $5,000 ceiling will be raised to $6,000 by 1982 -- representing a gradual expansion from the $3,000 earnings limit in 1977. Social Security recipients over age 72 may earn unlimited amounts without penalty and in 1982 this provision will apply to all recipients 70 years old.

Increasing numbers of retirements -- particularly voluntary early retirements -- point to a desire to leave the workworld. However, there are trends being found which show a reversal of employee preferences for early retirement; a majority now indicate their desire to keep working past the normal retirement age.

Older Americans are a constituency of significant economic and social impact. Issues of concern to them get attention by policymakers. The need for older workers in the United States economy will make necessary less stringent Social Security restrictions, delayed or phased-in retirement, more flexible work schedules and personnel policies which consider the older worker.

Business must recognize the impact which older Americans can make on the economy, both as workers and as consumers. They are already active politically -- in the 1978 Congressional election, the precentage of older Americans who voted was 10 points higher than the percentage for the total voting-age population (56 percent versus 46 percent).

There are increasing signals of the effect of the growth of the aging population on economic opportunities -- some of the signals novel. For example, as consumers, older Americans are having an impact on car rental business. Companies are offering discounts to specific retired groups -- groups which are now spending $12 million a year on car rentals, a sign that pensions and earnings from full-time or part-time work are providing funds for expenditures outside basic essentials.

Women In The Labor Force

Women streamed into the labor force in the 1970's, catching the forecasters and analysts by surprise. About three out of five people entering the labor force during the decade were women. During 1979 alone, women garnered 1.4 million, or two out of three, of the 2.1 million jobs added to the economy.

Females are expected to have continuing significant impact by entering the labor force at the rate of nearly 1 million per year during the 1980's. The labor force participation rate for women was nearly 52 percent at the beginning of 1980, compared to 43 percent a decade earlier. The participation rate is expected to increase to about 60 percent by 1990 and stabilize at that point until 2000, according to some projections.

Women's escalating participation in the labor force is attributed to their changing role in society, to economic factors, the growth of the service industry, increased education and equal employment influences. Females now in the 25-35 year range are establishing different patterns of life from those of their mothers. They tend to work for pay, marry later, have lower birth rates, divorce more than their mothers and continue to work outside the home after children are born.

Forty percent of the people marrying today will divorce. During the 1970's, the divorce rate increased 51 percent. This, too, has been a force in the workworld. In the last 10 years, almost three out of five women added to the labor force were single, divorced, separated or widowed. The number of families headed by females has been growing seven times faster than traditional husband-wife families.

The changes in the work habits of married women, whose participation rates increased from more than 39 percent in 1969 to more than 49 percent in 1979, have resulted in thriving numbers of two-earner families. In 1979, over 56 percent of all married households in the United States had two or more workers, excluding self-employed individuals.

Economic influences for the working married women include inflation and the need for more family income -- whether to purchase basic necessities, a home, college education for children or luxuries. Working is mandated for economic reasons, in most cases, for the single woman or the female head of a household.

Of the women who work, nearly 62 percent have children under age 18; over 45 percent are mothers of children under age six. In 1979, more than 30 million youngsters under age 18 had working mothers. Of the 30 million children, 7 million were under age six and nearly 23 million were six to 18 years old. According to the Urban Institute, another 3.1 million mothers with children under six and an additional 5.5 million mothers with youngsters six to 17 will be working in 1990.

Current data reveals that labor force participation rises with greater amounts of schooling and women increasingly are investing in more education. In 1978, for the first time, more females enrolled in college than males. This trend was reinforced in the 1979 college enrollments. Women are receiving a growing share of doctoral degrees. In 1970 women received 13.5 percent of the doctorals awarded in the United States, compared to 26.4 percent in 1978, the last year for which figures are available.

While women have created greater opportunity through better education, they also have been the beneficiaries of equal employment opportunity programs -- especially younger women. Special problems, however, remain for older women re-entering the work force after long absences. In the past, women have been an intermittent work force, in and out of the labor market. Much of the recent growth in the female participation rate was due to a rise in the number of weeks worked during the year -- not just to an increase in the number of women in the labor force. In time, women's commitment to careers and accumulated seniority will ease the re-entry problems, but they are expected to continue while the female's role in work is still in formation.

Much of the employment growth in the past decade has been in the service sector where jobs are traditionally filled by women and younger workers. The continuing shift of the economy toward services will provide employment for many women, but women in the 1980's are still likely to experience higher than average rates of unemployment and underemployment. The bunching of the middle layers of workers is likely to lessen the promotion opportunities for women and minorities as well as prime-age workers, as competition intensifies.

These developments could influence women to move to previously male-dominated areas of employment and away from the traditional female jobs; even though, as yet, societal sex roles -- particularly in the job market -- have not been overturned. This is supported in studies of wages for men and women. Contrary to popular perceptions, women's earnings are now less in relation to men's than they were 20 years ago. This is partly a result of occupational differences. In 1978 women employed fulltime and year-round made 59.4 percent of what men earned compared to 60.5 percent in 1969 and 61.3 in 1959. More than two-thirds of employed women now hold traditional female jobs such as teaching and nursing. As more women enter the labor force, the wages in female-oriented occupations will probably be driven down unless the number of jobs increases, too.

Minorities

The 1970's brought little improvement in the employment picture for minorities, both for cyclical and structural reasons. Jobless rates were high throughout the period and labor force participation rates declined as those looking for work simply dropped out of the job market in the face of a seemingly hopeless employment outlook.

Inadequate basic education, poor or non-existent job skills, obsolete job skills, location in depressed geographical areas, and discrimination were the main causes of minority unemployment. Comparisons of various groups of workers reveal the severity of the problem. In late 1979, black teenagers experienced unemployment rates of nearly 37 percent compared to about 14 percent for white teenagers and 34.3 percent for *all* minority youth.

Many stopped looking for work, decreasing the participation rates for minorities over the 10 year period. The participation rates for white and non-white males were fairly comparable at the start of the decade, measuring 80.1 percent for white males and 76.8 percent for non-white males. By the close of 1979, the gap had widened considerably as white male participation rates went to 78.5 percent and those for black males fell to 69.9 percent. Most of the difference came from trends for men under 35 years. The participation rate for white male teenagers was 66.1 percent in late 1979 compared to 39.7 percent for black male teenagers. In addition, incomes are lower for employed minorities. A comparison of earnings for fulltime and year-round male workers, in 1978, the last year for which figures are available, reveals annual incomes of $11,943 for Hispanics, $12,530 for blacks, and $16,360 for whites.

The problems of employment disadvantages and discrimination also show up in promotional opportunities available to minority workers who are still not receiving a fair share of higher wage jobs even though a large number of qualified or potentially qualified minority workers exists. A study by the Equal Employment Opportunity Commission found evidence of continuing discrimination in hiring, job assignments and promotion opportunities.

These problems are largely the result of employment disadvantages and discrimination: blacks are concentrated in lower-paying, less-skilled jobs and typically earn less than whites in the same occupation. In a major departure from previous patterns, however, the labor market for college-educated blacks improved considerably through the 1960's and 1970's. Among young graduates, the starting salaries and opportunities for blacks match or exceed those for whites.

Structural unemployment imposes economic and psychological costs on the jobless individuals along with substantial economic and social costs on the Nation as a whole. Economic costs include the lost incomes of the individuals and the payments for unemployment benefits, welfare, food stamps, as well as lost tax revenues on the incomes that individuals might otherwise have earned. For each percentage point in the unemployment rate there are direct and indirect losses of $16-20 billion to the Federal Government, according to estimates. Economic costs also include the misallocation of human resources and the loss of output. When one group suffers more from unemployment than others, the Nation suffers pervasive and long-term maldistribution of income.

While demographic changes for the future may relieve the overall unemployment situation, minorities likely will continue to experience labor market problems. Minority population -- as a result of higher birth rates and immigration -- is expected to increase more rapidly than the population as a whole. By 1990, one out of every five Americans will be black or Hispanic, according to one study. Blacks will comprise 12.2 percent of the 1990 population; Hispanics will account for 7 percent of Americans in 1990.

Immigration produces additional labor force changes, although the extent is difficult to measure. During the 1970's the number of legal immigrants to the United States averaged 430,000 per year. There is no precise information on the number of illegal immigrants in the country, but appraisals of the total size of the group range from 3 million to 12 million. Estimates of the flow of illegal immigrants into and out of the United States vary from 300,000 to 1 million persons a year. Rapid population growth in Mexico, among other factors, could cause significant additional immigration to the United States through the rest of the century.

There is some dispute over the nature of the impact of illegal immigration on the labor force. What evidence exists suggests that illegal aliens are predominantly male, with low education by U.S. standards, and low-skilled. While some analysts claim that illegal immigrants fill jobs that American workers do not want, others believe the main effect is displacement, with illegal workers undercutting the unemployed by taking jobs that otherwise might have to be upgraded by employers.

The degree to which illegal aliens affect the economy is also a subject of debate. For example, there is some evidence that more illegal workers pay taxes than withdraw benefits from government programs and services.

These issues are indicative of the serious and complex nature of the illegal immigration problem which defies a quick and simplistic solution. For this reason, when Congress created the Select Commission on Immigration and Refugee Policy, it specifically directed the Commission to study the illegal immigration problem and make recommendations based on its findings. The Commission will examine U.S. Immigration laws and the procedures governing the admission of immigrants and refugees -- the first such comprehensive look by a Congressional-Presidential Commission since 1911. The Commission will review the relationship of immigration and refugee policy to economic growth, employment and unemployment, foreign policy, and the Nation's scientific, cultural and political life. Some of the questions to be addressed include:

- Should the number of people admitted to the United States increase, decrease, or remain the same?
- How should the total number of people admitted from each region of the world be determined?
- Should preferences be given according to demographic or labor goals, family ties, or other economic criteria?
- How can the immigration process become more rational, efficient and humane?

The Commission is to report to the President and the Congress by March 1, 1981, and consideration of policy implications should await that report.

Education

Education levels of workers have risen considerably since World War II. Responding to favorable earnings prospects, an increasing proportion of young people completed high school and enrolled in college. College enrollments tripled and the number of graduates nearly doubled during the 1950's and 1960's with the boom overflowing into the early 1970's.

The pressure from the baby boom then shifted from the educational system to the labor market. An oversupply of college graduates drove down the economic value of a college education. Earnings of college graduates fell relative to those of high school graduates, and by some estimates, the advantage of a college degree in terms of higher lifetime income virtually disappeared. In 1978, one out of four employed college graduates held jobs traditionally requiring less formal education. And with graduates encountering such difficulties utilizing their backgrounds, new enrollments dropped at both the college and graduate levels.

The returns to investments in education could improve in the 1980's, as relatively fewer workers will have to vie with each other for entry-level positions. The job market for educated workers may still be prone to certain imbalances, however, excess supplies may develop in some fields that had reasonably good employment prospects in the 1970's if students adapt their choice of studies in response to past opportunities. Other areas may experience shortages -- particularly fields like engineering, physical sciences and economics that have greater employment possibilities in industry.

These changes suggest the need for continued examination of the relationships between work and education -- at all levels. Educational disadvantages -- including illiteracy and the most basic skill deficiencies -- pose insurmountable barriers to employment for many young people. In general, new links must be forged between education institutions, training programs and private employers to improve the transition from school to the labor market in the years ahead.

Lower fertility rates in America have led to a significant decrease in the enrollment of elementary schools where society's investment in future workers first begins. Secondary schools have experienced similar enrollment drops.

Elementary school enrollment, kindergarten through grade eight, crested in this country at 36.8 million students in 1969. There were 36.7 million elementary pupils in 1970 and 31.5 million in 1980. Enrollment is expected to decline into the mid-1980's and then rise slightly to near current levels of about 32 million in 1988. By 1990, elementary enrollment is expected to be close to 34 million, according to the National Council of Education Statistics.

America's largest senior class, numbering 3.2 million, graduated in 1977. High school enrollment is expected to decline until 1988, when there will be 11.1 million students. By 1990, there will be 12 million high school pupils. The 1970 secondary enrollment was 13.3 million compared to 13.7 million in 1980.

Education is also affected by the fact that Americans migrate. While there is a declining school age population nationally, nine states experienced increases in school age young people from 1971 to 1978, according to one study. This trend is expected to continue in a few states until the mid-1980's. Energy boom towns and rural migration patterns could cause marked growth in some education systems.

There were 11.5 million students in college in 1979 -- 4 million more than were enrolled in 1969. By 1990, college enrollment is expected to dip to 10.9 million -- 600,000 less than the 1979 registration according to the National Council of Education Statistics. The number of full-time students in colleges is decreasing while part-time student enrollment is rising. As the college age group of the United States reduces in size, colleges can be expected to step up recruiting programs to attract students from the smaller pool. Especially threatened by demographic changes are the small, private four-year colleges, although continued inflation is also considered a cause. In contrast, many of the public community colleges are flourishing as they attract older individuals returning to formal education -- often while continuing to work. The median age of community college students is 27 years, compared to nearly 21 for the traditional four-year college. About 49 percent of full-time and 87 percent of part-time community college students are employed in either a full-time or substantial part-time capacity (including mothers with children at home).

Competition dictates that traditional colleges and universities become more flexible in admissions policies. There is growing acceptance of education as a lifelong pursuit. Coupled with an increased practice of multiple careers during a worker's lifetime, education can provide the basis for a new career or better employment. In the information society now in formation, continued education will be necessary to keep pace with developments in the field.

In addition, leaving and reentering the educational system will likely become more common because of new demands from existing jobs. The future employment market will require not only competency in the basic skills, but also attention to increasingly complex job-related skills that enable employees to adapt to changing technology, employment patterns and job opportunities. Some professions -- such as law, medicine and teaching -- already have continuing education requirements in numerous states.

Companies have recognized the education need with tuition-aid programs -- with the company assisting or paying education costs for employees.

A recession could accelerate the college reenrollment rate as unemployed or underemployed people return to school -- with the hope of being in a better position to catch the upswing of economic recovery.

Worker Attitudes

Economic and social changes since World War II have influenced worker attitudes of the labor force in the United States. Education, affluence and technology are dominating factors in determining worker attitudes in a workplace which has undergone a shift in employment from manufacturing and manual occupations to service, technical and professional occupations.

Few members of today's work force have a personal memory of the great depression. While unemployment has not disappeared, it is believed the fear of job loss does not exert the same pressure on the 1980 work force that it did on previous generations. To some extent, this pressure has been alleviated by union agreements which provide a variety of protections against arbitrary layoffs, some compensation when plants close down, and in some instances advance notice of layoffs. These agreements and other factors, such as better economic security arising from substantial improvements in employee benefits and improved living standards, have led to changes in the way workers perceive their jobs -- although just how jobs really are perceived seems to be a debatable question. However, there does seem to be a measure of agreement that something can be done in terms of influencing attitudes and thereby improving productivity.

Studies conducted during the middle to late 1970's seem to show that many workers were no longer preoccupied with the necessity to strive for survival and security, but rather that they had shifted attention toward a desire for greater self-fulfillment on the job. According to these studies, most workers:

- Were increasingly dissatisfied with specific aspects of their work.
- Felt that their skills and educational experience were being underutilized.
- Had more self-respect and wanted to be treated as individuals.
- Wanted opportunities to grow in their jobs.
- Wanted freedom to set their pace and the right to influence decisions affecting them.

Counter studies have challenged these findings and question whether sufficient evidence exists to prove:

- Widescale or growing discontent with work.
- That workers are demanding redesigned or enriched jobs.
- A need for workers to turn attention to self-fulfillment once financial security is achieved.
- That job redesigners know how to organize work in a way that would elicit sustained, high levels of human satisfaction and productivity.
- Low productivity among "overeducated youth."

This group would argue that while the degree of economic security now afforded workers is probably laudable, this security has been granted over the years in the form of entitlements or economic "rights" which has resulted in a concommitant reduction in the worker's sense of responsibility toward the quantity and quality of his work. During periods when rising inflation and higher taxes combine to erode real incomes of workers, these factors also serve as disincentives to work. What will motivate a worker or instill in him a sense of responsibility or job satisfaction will vary, since workers are not all alike. They have different needs and interests which are constantly changing.

Another study by the Bureau of Labor Statistics notes that the commitment to the work force of young adults (ages 20-24) is far stronger than in the past. Indeed it is now equal to that of the 25-44 group whose labor force participation rate is highest. In addition, evidence points to the fact that these workers are eager to make a contribution to the world.

American industry has available to it a vast potential resource in the form of the best educated work force in the world. It is a work force that appears in large part to be committed to work and is capable of improved performance, if properly motivated. How to bring out the best in the American worker who really feels that he is able to contribute, but in many instances may not be able to do so, will be an increasing challenge to American industry. A better blend of the interests of the worker and the company can result in payoffs in terms of increased worker satisfaction/responsibility and improved profit and productivity.

Regardless whether the worker today is poorly motivated because he is dissatisfied with his job or because he lacks a sense of responsibility toward his job, there does seem to be room for change in his role. There seems to be general agreement that one means of improving worker performance would be to encourage greater worker participation along with a shift from the traditional adversarial relationship between labor and management to one of cooperation. Efforts to effect this enhanced cooperation and participation have been attempted here and abroad in a variety of programs.

In Japan, workers are organized into quality control circles to take responsibility for improving the quality of their work; in Germany, workers have won the right to membership on all corporate boards of directors; and in Yugoslavia, workers are now learning to manage state-owned firms.

It is not at all clear that the United States should or could adopt any of these models, because it is culturally, economically, and politically different from Japan, Germany and Yugoslavia. It is believed America can, however, learn from these nations that it is possible to increase worker participation and responsibility.

In fact, a growing number of American companies are drawing upon the experience of foreign nations, particularly that of Japan, and adapting ideas to fit their individual needs. While the movement is not widespread at this point, about 70 companies were experimenting in early 1980 with quality circles.

General Motors, in conjunction with the United Automobile workers, has established about 100 quality circles. One of the earliest of these experiments involved one of the company's older assembly plants at Tarrytown, New York. As a result of the effective cooperation between company management and the union, it is now reported that the number of workers' grievances has been sharply reduced; product quality has greatly improved, and warranty losses are markedly down; and absenteeism and turnover have also been reduced greatly. As a result of its improved efficiency, Tarrytown became one of the first plants to which the company assigned its new small car production. Another quality group solved a recurring problem of flat tires on some of its automobiles by recommending that a defective tire stem be replaced. The solution resulted in an annual savings of $225,000 to the company.

At Northrop's aircraft plant in Hawthorne, California, a quality circle of mechanics assembling the F-5 military fighter plane found that workers kept breaking expensive drill bits when they bored into the titanium on the tail of the aircraft. After a lengthy analysis, the angle of the drill was changed slightly, resulting in fewer broken bits and savings of $28,000 a year. American Airlines saved $100,000 a year by acting on a suggestion of one of its quality circles to replace old hand grinders with new, more efficient tools.

The 1980 agreements between major steel companies and the United Steel Workers of America represent a notable breakthrough in this area. The contracts include provisions calling for the organization of quality of work circles aimed at achieving twin goals of better humanizing work and improving worker productivity.

Since variations exist from firm to firm, and job to job, such cooperative efforts will vary depending on individual needs. Other cooperative labor-management programs have involved work redesign with the objective of increasing worker satisfaction and helping them to share in a larger degree of participation in decisionmaking, employee stock ownership plans, incentives for teaching other workers, peer-set salaries and raises, peer-established work/plant rules, self-managed quality control, and cash bonus plans.

Although the experience in this country has been limited, some evidence suggests that involving employees in management decisions and other areas of company operation has resulted in increased productivity, cost savings, and enhanced worker interest.

Over the coming years, the American economy will become more labor intensive as the service industries continue to grow. It will become increasingly important to derive best performance from this work force, for failure to do so will result in some degree of productivity loss. Greater advances in the area of labor-management cooperative efforts may prove useful in making optimum use of employees' skills and education experience, with resulting gains for the worker, the firm, and the Nation.

V
STRUCTURE OF EMPLOYMENT

Growth Of Service Industries

Employment growth in the 1970's centered in the service and trade sector, with nine out of ten new jobs during the decade in service industries. By the end of 1979, services accounted for 67 percent of all jobs in the economy, compared to 60 percent in 1969 and nearly 55 percent in 1959.

The goods producing sector of the economy provided one-third of all jobs at the end of the 1970's. The share of employment in goods producing industries declined from 45 percent in 1959 to 40 percent in 1969 to 33 percent in 1979.

The transfer in employment away from goods producing and toward service industries coincided with changes in the supply of labor. Those industries which expanded most rapidly -- such as retail trade, insurance and professional services -- generally have had higher proportions of women and young workers as employees.

While service industries benefited from large numbers of workers available at entry level wages, the major impetus to change in the industrial structure of employment was a changing pattern in the demand for labor. The 1970's marked a general shift to industries requiring larger numbers of workers. These labor-intensive industries were less adversely affected by rising energy costs, the impact of government regulations and other policies which made capital investment more costly.

Consumers changed their spending patterns during this period -- away from nondurables to services and durable goods, contributing to service industry growth. Large numbers entering the household formation stage and increased incomes in two-earner families -- plus liberalized use of credit -- provided a strong market for appliances, furniture, automobiles, fast-food restaurants, and other time-saving services. Unlike the service sector, however, employment in durable goods manufacturing did not increase as sharply in response to consumer demand.

Employment growth for the next two decades is expected to follow the pattern set in the 1970's. New household formations and two-earner families should keep the demand for housing and household-related durable goods growing at a relatively strong pace through the 1980's. This growth expectation suggests a moderate employment increase is possible in durable goods manufacturing industries; but productivity, import levels and cyclical factors will influence the degree of employment growth in manufacturing industries.

Demographic factors point to continued strong demand for housing through the 1980's, which should spur growth in the construction industry if other economic factors are resolved. During the 1980's there will be an approximate 33 percent increase in the number of family heads in the central age bracket, 25-44, the group that has traditionally purchased or occupied the majority of new housing. By 1990, it is projected there will be 87 million households, a 16 percent increase over 1980. Of these new households, 75 percent (9 million of the 12 million) will likely be headed by persons under age 45.

As the older population increases in size, the demand for health care and related services will expand. Technological changes, particularly in the area of telecommunications, will result in the growth of new types of industries and employment.

Some experts contend that the pace of the service sector employment growth may slow. There will be fewer young workers available because of the lower fertility rates; and some industries may substitute capital for labor. New technology will increasingly mechanize many of the occupations which now hire large numbers of women, potentially affecting such jobs as telephone operators, bank tellers, sales workers, food service workers and secretaries.

A variety of factors will likely influence the substitution of capital for labor in service industries such as the availability and cost of capital. Too, the crowding of the prime-age worker group (age 25-44) could cause some of these workers to spill over into jobs which would generally be considered for entry level workers. This shift would offset the reduced numbers of young workers coming into the labor force who usually are the primary candidates for entry level positions.

Structural Shifts

Broad shifts in the industrial structure of the United States tell only part of the story. Patterns of employment in individual occupations and narrower categories have often changed sharply, making growth industries of one decade the declining industries of the next. The aerospace industry and the teaching profession went through such boom-to-bust cycles, while mining reversed a two-decade decline and expanded rapidly in the 1970's.

Methods to forecast structural shifts in large categories of industries are more accurate than attempts to identify coming changes for detailed occupations. More accurate projection methods would aid in matching human resources to employment needs and in minimizing long-term displacement of workers.

The impact of structural shifts on some individual U.S. industries threatens to be particularly severe in the years ahead. The steel industry is suffering from the effects of foreign competition and changes in domestic demand. Some of the same problems threaten the automobile industry. The huge investments needed to shift production to smaller cars, competition from foreign manufacturers, and rising gasoline prices continue to have a substantial impact on United States automakers into the 1980's.

The problems of displacement in industries like steel and automobiles will require major revisions in the country's training and retraining programs. Current programs are not equipped to cope with large scale dislocations, involving tens or even hundreds of thousands of workers. Successful adjustments in these cases will depend on maintaining a strong overall rate of economic growth and forging new links in the retraining and placement processes between government and the private sector.

Occupational Changes

White collar jobs accounted for nearly two-thirds of the employment growth during the 1970's, as the swing from blue collar to white collar jobs continued.

At the advent of the 1980's, white collar occupations represented 51 percent of total employment, compared to about 48 percent at the start of 1970. Blue collar occupations accounted for about one-fifth of the employment growth during the 1970's, but as a percent of total employment, the blue collar share actually declined during the decade -- from 36 percent to 33 percent.

The remaining jobs -- farm and service occupations such as waiters and police -- supplied very little of the decade's employment growth. Service occupations increased slightly from 12 percent in late 1969 to 13 percent at the end of 1979; farm occupations, as a proportion of total employment, declined from nearly 4 percent to about 3 percent.

Rapid growth in the professional and technical category is a key factor in the growth of white collar occupations. A sharp drop in operative jobs -- such as assembly line workers, laundry/dry cleaning workers and dressmakers -- contributed to the decline in the number of blue collar workers.

Growth of service and trade industries -- which tend to employ a higher number of white collar workers -- paralleled the growth in the white collar occupations. However, even in industries which tend to employ more blue collar workers -- such as manufacturing -- the number of white collar workers grew at a faster pace than the number of production workers.

Projected growth for service and trade industries in the 1980's points to large employment gains in white collar occupations.

Further gains can be expected for sales, managerial and administrative workers as services and trade expand. White collar technical jobs should increase fairly rapidly along with advances in technology in the capital intensive goods producing industries. Meanwhile blue collar employment is likely to decline slightly in the 1980's.

Technological Change

Technological change will influence the American workplace in the next decades as the United States enters the age of the information society. The impacts of low-cost computers, distributed computing and microprocessors could be enormous in terms of the way Americans live and work. The effects of the interaction between these technologies and development in the use of laser beams will parallel those of advances in transportation, communications and energy in earlier generations.

Robots -- with the aid of computers and microprocessors -- are already being utilized in automotive, aerospace, appliance, metalworking, glass, rubber, and machinery industries. They are performing a variety of tasks, including welding, painting, cutting, assembling and machine loading. Worldwide robot sales in 1979 were $279 million and are expected to grow to $4.6 billion by 1990. Last year Japan and the United States were closely matched in total value of robot sales, with about $90 million each. Robot sales, as a portion of gross national product, were greater in Japan, however, because of the differences in the size of the two economies. As a share of GNP, Japan spent three times as much on robots as the United States did. By 1984 the Japanese government plans to have an unmanned metalworking plant on line, producing machinery components ranging from hydraulic pumps to heavy duty transmissions. Every operation from casting to final inspection will be handled by flexible automatic systems and robots, all supervised by a central computer and a few engineers and technicians.

While robotic machinery currently performs relatively simple tasks, developments in the area of sighted robots will allow for the integration of the machinery into more complex operations. One company has developed a robot with visual and tactile capabilities that can assemble a finished product from a jumbled assortment of parts. While such a machine now operates with the assistance of television cameras at a slow pace, experiments underway with digital processing and laser scans will significantly cut the robot's assembling time.

The combination of computer technology, miniprocessors and communication via laser light will have significant effects on the office of the future and microelectronics undoubtedly will have a major impact on the performance of many clerical and administrative jobs. In the office of the future, most of the paper-handling routines that consume so much time and space will likely be gone.

Once the electronic office and advanced robotic machinery comes on line, the impact could be immense. Many workers and clerical assistants may be replaced through automation. But, at the same time, large numbers of highly skilled technical and engineering jobs could be created, too.

The social impact of this revolution is expected to be dramatic. Many have raised the spectre of vastly increased unemployment as robots and other machinery replace millions of workers. Others believe that fears of automation-induced unemployment appear unfounded. As long as markets and production expand, increased productivity does not have to result in reduced employment. Over the past decades, increases in industrial productivity were accompanied by growing employment figures.

Nonetheless, significant adjustments will be required and retraining promises to be at the top of the list. The jobs created by widespread use of robots and other forms of electronic devices -- technicians, programmers, engineers -- for the most part will require a greater degree of technical training. To prevent the creation of an oversupply of workers whose skills have become or may become obsolete, and a simultaneous shortage of engineers and technicians, training and education programs which are more carefully coordinated with market developments will be needed.

Some companies have already acknowledged this adjustment need in tuition-aid programs whereby the company pays all or part of the pertinent costs of employees enrolled in formal education or training courses at conventional institutions. Currently, only a small percent of several million covered employees participate; however, there is indication that a much larger rate of participation can be expected where companies make a deliberate implementation effort.

Work Time: Greater Flexibility

Popular interest in alternative ways of structuring time at work has grown steadily in recent years, reflecting the increased labor participation of women as well as other lifestyle changes. Currently, about 13 percent of American businesses and 6 percent of all workers have flexible work schedules of some kind. Plans that vary the timing of work hours, along with increased vacation time earned, is likely to become increasingly commonplace in the 1980's.

While less practical for assembly lines and multi-purpose work situations, the typical pattern of permitting people to work a core period of time each day, (for example, from 10 a.m. to 3 p.m.), while varying their arrival and leaving hours has been relatively easy to implement in offices and some service industries.

The expansion of part-time work opportunities has provided another means of accommodating workers' needs for additional flexibility. Future growth -- at least of permanent part-time positions -- will probably be slower, however. Because of rising payroll taxes for Social Security and unemployment insurance, as well as the fringe benefit requirements in many labor contracts, hiring part-timers could be considerably more costly to an employer than other alternatives.

For full-time workers, a 40 hour week is still the norm. After dropping from 58 to 42 hours between 1900 and 1940, the average work week for fulltime males has changed relatively little in the past four decades. Since reductions in the work week generally accompany increases in productivity -- which was rising at the rate of 3 percent a year during the first two post-war decades -- the stability of the 40 hour week was not expected.

By other measures, however, total time spent at work has increased. Many of the women and teenagers holding part-time jobs, for example, were previously not in the labor force.

With the future increase in the ratio of prime-age workers, the growth of vacation time and paid holidays will probably further reduce time spent at work. The average vacation period in the United States is still only two weeks, reflecting the relatively short average job tenure in private industry. But with many establishments offering 4 to 6 weeks of vacation to experienced workers, vacation patterns may change significantly as the new entrants of the last two decades gain seniority on the job.

Length of job tenure with a particular company is the usual basis for vacation eligibility in the United States. In 1978, it was estimated that average job tenure was 3.6 years, down from 3.9 years in 1973. This reduction was the result of the large labor force inflow of teenagers and women. In 1978, as many as 28 percent of the employed population had been on their jobs less than one year and the average length of vacation was 2.0 weeks, compared to 1.9 weeks in 1968.

The baby boom group which will form the prime-age work force in the 1980's and the 1990's is expected to change that, as there will be many more workers with longer job tenures. These prime-age workers are also expected to be less mobile, choosing to stay with the same job longer than past generations. This would result in an increase in the average length of vacation time and increased vacation benefits being paid by employers.

Special Study on Economic Change

Louis C. Krauthoff II, ***Director***
George D. Krumbhaar, Jr., ***General Counsel***
Bill R. Maddox, ***Editor***

HUMAN RESOURCES AND DEMOGRAPHICS

Prepared under the direction of:

E.M. Kassalow
Senior Specialist
Congressional Research Service

AND

Mary Jane Maddox
Associate Project Director, SSEC

Contributing Director:
Charles Sheldon
Director of Research

Staff Associates:

Margaret Blaszak, ***SSEC***
Mary Eccles, ***Economist - JEC***
Dennis L. Little,
Specialist in Futures Research, CRS

Research Assistant:
Catherine Hinkle

Participants on Hearing Panels

(Listed in order of appearance)

PETER A. MORRISON, *The Rand Corp.*
CALVIN L. BEALE, *Department of Agriculture*
THOMAS MULLER, *The Urban Institute*
ROBERT THEOBALD, *Participation Publishers*
GEORGE H. BROWN, *The Conference Board, Inc.*
JERRY L. FLETCHER, *U.S. Department of Health, Education, and Welfare*
MAYER N. ZALD, *University of Michigan*
DAVID J. BJORNSTAD, *Oak Ridge National Laboratory*
KARL E. TAEUBER, *University of Wisconsin*
ARNOLD PACKER, *Department of Labor*
BERNARD E. ANDERSON, *University of Pennsylvania*
EDWARD A. ROBIE, *The Equitable Life Co.*
ALICE M. YOHALEM, *Columbia University*
HAROLD L. SHEPPARD, *American Institutes for Research*
DAVID S. NORTH. *New Trans Century Foundation*
JEROME A. MARK, *U.S. Bureau of Labor Statistics*
EDWARD F. DENISON, *The Brookings Institution*
SOLOMON FABRICANT, *National Bureau of Economic Research*
TED MILLS, *American Center for the Quality of Work Life*
GEORGE POULIN, *International Association of Machinists and Aerospace Workers*
JOAN MEBANE, *Phillip Morris Corp.*
MICHAEL K. EVANS, *Chase Econometrics Associates*
JOHN W. KENDRICK, *George Washington University*
GEORGE H. KUPER, *National Center for Productivity and Quality of Working Life*
JEROME M. ROSOW, *Work in America Institute*
ROBERT L. CLARK, *North Carolina State University*
JACK CARLSON, *U.S. Chamber of Commerce*
HOWARD YOUNG, *United Auto Workers*
JOHN L. ZALUSKY, *AFL-CIO*
ELI GINZBERG, *National Commission on Manpower Policy*
IRVING LEVESON, *The Hudson Institute*
GARDNER ACKLEY, *University of Michigan*
HENDRIK S. HOUTHAKKER, *Harvard University*
JACK A. MEYER, *Council on Wage and Price Stability*
BENJAMIN M. FRIEDMAN, *Harvard University*
HYMAN P. MINSKY, *Washington University*
LEIF H. OLSEN, *Citibank of New York*
ROBERT R. CHAMBERS, *Atlantic Richfield Company, Inc.*
ALLEN SINAI, *Data Resources, Inc.*
GARY M. WENGLOWSKI, *Goldman, Sachs and Company*
KENNETH E. BOULDING, *University of Colorado*
TILFORD C. GAINS, *Manufacturers Hanover Trust Company*
F. THOMAS JUSTER, *University of Michigan*
DOUGLAS N. ROSS, *The Conference Board, Inc.*

The Human Resources and Demographics section of the Special Study on Economic Change, Joint Economic Committee, is one of 10 sections to be released over the next several weeks. Final printing later this year will include all areas of the special study. Orders for this Human Resources and Demographics study may be placed by contacting:

Special Study on Economic Change
Joint Economic Committee
Room 1537
Longworth House Office Building
Washington, D.C. 20515
Telephone: (202)225-3565

Energy and Materials:

A Shortage of Resources or Commitment?

Joint Economic Committee

Special Study on Economic Change

A staff study

August 1980

(49)

The Joint Economic Committee's Special Study on Economic Change (SSEC) was inaugurated under the leadership of then Chairman Richard Bolling (D.-Mo.) and Vice Chairman Hubert H. Humphrey (D.-Minn.), together with Senator Jacob K. Javits (R.-N.Y.), ranking Minority Member.

The study progressed through Mr. Bolling's chairmanship and into the leadership of Senator Lloyd Bentsen (D.- Tex.), chairman; and Congressman Clarence J. Brown (R-Oh.), ranking Minority Member. The goal of the SSEC is to chart the major changes in the economy and to analyze their implications for policymakers.

Volumes of the Special Study on Economic Change

Human Resources and Demographics
Energy and Materials
Research and Innovation
Stagflation
Government Regulation
Federal Finance
State and Local Government
Social Security and Pensions
The International Economy
Productivity

JOINT ECONOMIC COMMITTEE

LLOYD BENTSEN, Texas, *Chairman*
RICHARD BOLLING, Missouri, *Vice Chairman*

SENATE	HOUSE OF REPRESENTATIVES
WILLIAM PROXMIRE, Wisconsin	HENRY S. REUSS, Wisconsin
ABRAHAM RIBICOFF, Connecticut	WILLIAM S. MOORHEAD, Pennsylvania
EDWARD M. KENNEDY, Massachusetts	LEE H. HAMILTON, Indiana
GEORGE McGOVERN, South Dakota	GILLIS W. LONG, Louisiana
PAUL S. SARBANES, Maryland	PARREN J. MITCHELL, Maryland
JACOB K. JAVITS, New York	CLARENCE J. BROWN, Ohio
WILLIAM V. ROTH, Jr., Delaware	MARGARET M. HECKLER, Massachusetts
JAMES A. McCLURE, Idaho	JOHN H. ROUSSELOT, California
ROGER W. JEPSEN, Iowa	CHALMERS P. WYLIE, Ohio

John M. Albertine, *Executive Director*
Louis C. Krauthoff II, *Assistant Director-Director, SSEC*
Richard F. Kaufman, *Assistant Director-General Counsel*
Charles H. Bradford, *Minority Counsel*

Table of Contents

CHAIRMAN'S INTRODUCTION i
Senator Lloyd Bentsen

RANKING MINORITY MEMBER'S INTRODUCTION iv
Rep. Clarence J. Brown

I. ENERGY: THE KEY TO GROWTH 1

II. ENERGY CONSUMPTION...................... 8

III. ENERGY SUPPLY 10

IV. CURRENT U.S. ENERGY POLICIES........... 13

V. ENERGY AND STAGFLATION................ 23

VI. POLICY RECOMMENDATIONS 25

VII. MATERIALS 29

VIII. POLICY RECOMMENDATIONS 36

CHAIRMAN'S INTRODUCTION

Senator Lloyd M. Bentsen

Chairman, Joint Economic Committee

Among the factors which might limit growth in America, none looms larger than energy and critical materials. These restrictions, however, can be overcome; for to allow ourselves to be hobbled by insufficient supplies of energy and important materials is to adopt a defeatist attitude and to condemn present and future generations to an eroding standard of living. I do not believe today's adults want to leave behind that legacy.

The Joint Economic Committee's Special Study on Economic Change charts a course which urges continued and improved conservation and increased U.S. production; enough to significantly reduce foreign imports from insecure sources.

The course is not easily accessible nor effortlessly traveled because our future energy supply depends to a large degree on conservation. But Americans possess the resolve to meet challenges head-on, having already shown their conservation fortitude by saving energy in 1979 which is the equivalent of almost a billion and a half barrels of oil.

We must maintain that momentum and even improve upon it. Yet, even with maximum conservation, the United States will have to produce more domestic energy or else increase to dangerous levels imports from insecure foreign sources.

Energy consumption must grow if we are to meet the demands of an expanding labor force and to spur necessary economic growth. It is neither surprising nor accidental that the nations which experienced the highest growth rates in energy consumption during the last decade were also the countries which enjoyed the greatest economic expansion. For example, Japan and Canada each increased energy consumption by more than 3 percent annually between 1970 and 1979. Their annual growth rates of real GNP were more than 4.5 percent.

The staff study emphasizes that, even with heroic conservation efforts, the United States needs to increase energy consumption in the 1980's by 2 percent annually to support a desired annual GNP growth rate of 4 to 4.5 percent. To do this, America by 1990 would need to drastically increase energy production or increase to unacceptable levels unhealthy foreign imports.

While the study charts three possible energy prospects for the future, the most likely expectation is that domestic energy production can increase about 24 percent by 1990, and that imports can remain about the same as in 1979. A 24 percent increase would be the equivalent of 7.4 million barrels of oil per day.

Important in the increase of domestic energy is the enhanced recovery of crude in the United States. The study does not assume any new major oil discoveries in the next 20 years, but recommends enhanced oil recovery which could increase domestic production.

The study recommends that conversion from insecure to secure energy sources be a major option in Federal policy. Ending our unhealthy reliance on petroleum imports does not mean literally ending all oil imports. This is not a realistic goal, nor is it desirable. What we should work for, though, is a situation in which our economic well-being is no longer at the mercy of any country or any cartel of countries.

While attempting to shed the albatross of insecure foreign energy sources, we also must attempt to break from the apron strings of excessive reliance upon foreign material supplies. America's mineral industry is even more dependent upon foreign countries than is the oil industry. About 44 percent of the petroleum consumed in the United States in 1979 came from foreign sources, but there are critical materials for which we are dependent for more than 80 percent.

America's energy conservation efforts cannot succeed unless specific materials are available in sufficient supplies, because more fuel efficient transportation requires materials which are largely under foreign control. Platinum, cobalt, chromium, and manganese are not -- like oil -- generally known to be among the economy's necessities, but they are critical. They are essential to the industrial system, yet they stand dangerously close to being under the wraps of an OPEC-type cartel.

These problems will not vanish unless there is a major commitment to increased investment which produces greater supplies of domestic energy and materials. Decisions which will have an effect in this century cannot wait until the 1990's. We will be able to provide for tomorrow only if we produce more today.

Ranking Minority Member's Introduction
CONGRESSMAN CLARENCE J. BROWN

Energy lies at the heart of much of the economic, political and military tension in the world today, and in the U.S. in particular. This special staff study on energy is a very comprehensive effort to provide an unemotional and practical examination of the energy situation and what to do about it.

The U.S. is becoming increasingly reliant on unstable foreign sources of energy, particularly oil. This situation has been greatly exacerbated by ill-advised attempts to hold down domestic energy prices below world levels. These price ceilings were a well-meaning but ill-fated attempt to avoid the pain of adjustment to a new reality. They were rationalized on the wholly erroneous idea that the price of energy would have little impact on conservation, production, or the development of alternative fuels. All the ceilings accomplished was to delay the inevitable, at the cost of lost time, reduced national security, and enormous waste and misallocation of resources.

This tragedy had repercussions well beyond the energy industry. Witness the current crisis in the U.S. auto industry. U.S. auto manufacturers failed to make the switch to the production of smaller, more energy efficient cars at least in part because of a policy of artificially cheap energy. The suffering and economic losses of those laid off in the auto and related industries -- and the resulting costs to taxpayers for income maintenance programs and industry assistance -- must be counted as a cost of not adjusting to changed circumstances. The years of waste and lost growth for the whole country will far outweigh the costs which would have been incurred by adjusting early to the energy shortage -- even including the costs of giving appropriate assistance to the poor where and when needed.

I wish we could have had cheap energy forever, which would make everyone happy. But the grim reality is that expensive energy is going to be our lot for years to come and we will have to make the necessary national policy and personal adjustments to cope with it.

This staff study points out very clearly that the U.S. has made strides in energy conservation in response to rising market prices. Much remains to be done and is being done to improve the energy efficiency of homes and factories. And much is being done to move to a more fuel-efficient auto fleet.

The rising price of energy has also led to greater efforts than ever before to discover and produce oil and gas from traditional sources. But the increasing scarcity of easily-accessible oil and gas means that other steps must also be taken. Enhanced recovery techniques, greater coal production and use, solutions to the problems of nuclear power and synfuel and solar research all must be pursued. The report is correct to stress this multi-faceted approach. The government cannot know in advance which fuels or technologies will yield the biggest payoffs. To over-emphasize one energy source while cheaper sources lie underutilized would be ruinously expensive. The marketplace will choose quickly the most efficient technologies as they begin to emerge.

The theme of the study is energy and growth. Savings and investment become doubly important in this context. Growth requires savings and investment both indirectly, to produce the energy our industries need to function and grow, and directly, to improve general productivity through modernization and expansion of plant and equipment. Simply diverting our already inadequate savings out of industrial modernization and into energy production will not cure stagflation. I wholeheartedly support the study's recommendations for increasing corporate and personal savings through faster depreciation write-offs and lower tax rates on savings income and capital gains. The study drives home the fact that energy policy cannot be made in isolation. Just as energy is an integral part of the economy, energy policy is an integral part of general economic policy.

Special Study on Economic Change

Louis C. Krauthoff II, *Director*
George D. Krumbhaar, Jr., *General Counsel*
Bill R. Maddox, *Editor*

ENERGY AND MATERIALS:
A Shortage of Resources or Commitment?

Prepared under the direction of

Timothy P. Roth
Senior Economist, SSEC

Contributing directors

Charles Sheldon
Director of Research

Spencer Beresford
Associate Director
International Technical Services

Oscar Gass
Associate Director
Consulting Economist

I

ENERGY AND MATERIALS:

The Key to Growth

America can end an era of increasing energy imports *and* increase consumption to levels of economic necessity in this decade if a commitment is made to provide major investment in energy, energy-related industries and conservation.

A three-pronged effort is required -- increased domestic production, improved conservation and conversion from insecure to secure import sources.

In its quest, the United States cannot afford to ignore the pursuit of all options ranging from oil and gas to coal to safe nuclear, synthetic and solar energy. Substitution of secure import supplies from insecure sources is important, because imports are expected to continue to provide significant amounts of oil at least in the next 10 years and possibly for the remainder of this century.

To position itself to reach energy independence in this century would require that about 3 percent of real gross national product (GNP) be spent in the 1980's on domestic energy production and conservation. Under the optimistic, or energy independent, scenario of this study, such massive expenditures could increase domestic production of all energy sources 46 percent. The net result would be to reduce import requirements from 21 percent of consumption in 1979 (Table 1, Page 3) to 3 percent in 1990. To arrive at such an optimistic point would require that numerous restrictions on increased domestic production be resolved in the 1980's.

A *more likely* course (Table 2, Page 4) is that domestic production can be increased 24 percent by 1990 and energy imports be held to about the 1979 level. Regardless the manner in which supplies are achieved, without substantial increases in energy availability:

- The economy will not grow fast enough to accommodate the growing labor force, and plant and equipment will be either idled or under-utilized.
- Productivity and real incomes will continue to decline.
- The competitive position of American industry will deteriorate still further.
- Increases in defense spending or on social programs would be attainable only at the expense of *other* things. Investment in plant and equipment would probably be most affected.

This study emphasizes the significant role of conservation in U.S. efforts to reduce foreign reliance while improving the Nation's economy. It assumes a 33 percent improvement in energy efficiency in the 1980's and an additional 25 percent conservation improvement in the 1990's. Without continued improvement in conservation, the United States needs an increase in energy consumption of .6 percent to obtain a 1 percentage point increase in GNP.

This study assumes, however, that over the decade of the 1980's, conservation efforts will reduce to about .4 percent the increase in energy consumption required to realize a one percentage point expansion of GNP.* This assumption should be considered in light of the fact that most of the easy conservation efforts have already begun. In the future, more efficient energy use will be predicated largely upon costly modification and replacement of the Nation's capital stock. Large investment will be required to make plant and equipment, housing and motor vehicles more energy efficient.

This would have the desirable effect of directly reducing reliance on foreign energy sources. However, energy conservation investment cannot completely solve the problem. Conservation must be encouraged through the natural market mechanism of higher energy prices; a mechanism that has already begun to work.

Because this study takes serious account of the national conservation momentum, a desired 4.0 to 4.5 percent annual growth rate of GNP is assumed to require a 2.0 percent annual increase in energy consumption. If the impact of conservation were not considered in this energy use assumption, a 4.0 to 4.5 percent annual growth rate of GNP would require an energy consumption increase of roughly 2.5 percent per year.

During rapid economic growth years (1960-1973), domestic energy consumption rose 4 percent per year. During the slow growth period (1973-1979), the average annual growth rate of energy consumption fell to 1 percent, and by 1979 domestic energy consumption was 78 quads. A quad of energy is one quadrillion British thermal units (Btu's), a measure of heat. One quadrillion is a thousand trillion. In rough terms, one quad of electrical energy would be enough to serve the needs of 16 cities with 600,000 people each for one year. Assuming that energy consumption rises annually by 2.0 percent, by 1990 the United States will consume 95 quads of energy per year.

---

* In recent years the energy-GNP ratio -- defined as the percent change in energy consumption divided by the precent change in real GNP -- has averaged roughly 0.6 percent. That is, a one percent change in GNP results in a six-tenths of one percent change in energy consumption. A 33 percent improvement in energy conservation would, by 1990, result in an energy-GNP ratio of 0.4 percent.

The contribution of energy conservation -- especially in the form of increasingly efficient energy use -- has already been significant. Had energy consumption per constant GNP dollar continued at its 1973 level, energy consumption in 1979 would have been 86 quads. Actual 1979 energy consumption was 78 quads. Therefore, conservation resulted in a saving of 8 quads of energy in 1979.

The *potential* role of energy conservation is even greater. This study assumes that energy conservation in the 1980's will improve by 33 percent over its 1979 level. This, coupled with a 4 percent growth rate of real GNP, would result in an annual saving of 25 quads of energy in 1990.

Table 1 depicts the composition of domestic energy consumption and production in 1979.

TABLE 1
1979 Domestic Energy Consumption and Production
(Quads)

	COAL	NATURAL GAS	PETROLEUM	HYDRO-ELECTRIC POWER	NUCLEAR ELECTRIC POWER	TOTAL
DOMESTIC CONSUMPTION	15	20	37	3	3	78
% of Total Consumption	19%	26%	47%	4%	4%	100%
DOMESTIC PRODUCTION	18	19	20*	3	3	63
% of Total Production	29%	30%	32%	5%	5%	100%
NET ENERGY IMPORTS	(2)	1	17	0**	0	16
% of Total Consumption	(3)%	1%	22%	0%	0%	21%

Totals may not equal sum of components because of independent rounding

* Includes Natural Gas Plant Liquids.

** About 0.18 quad, or 0.2 percent of total energy consumption.

NOTE: Parentheses denote net exports.

Table 1 confirms petroleum's dominant role among the types of energy consumed in America. However, as Table 2 illustrates, this role is subject to considerable inertia. Table 2 is based upon alternative 1990 *optimistic*, *pessimistic* and *most likely* domestic production levels of the various energy sources.

TABLE 2
1990 Domestic Energy Production and Consumption and Net Energy Imports (Quads)

	OPTIMISTIC	PESSIMISTIC	MOST LIKELY
COAL	30	21	22
NATURAL GAS	22	19	21*
PETROLEUM	22	18	21**
HYDRO POWER	5	3	4
NUCLEAR POWER	6	3	5
OTHER	7	2	5
TOTAL DOMESTIC PRODUCTION	92	66	78
TOTAL DOMESTIC CONSUMPTION	95	95	95
NET ENERGY IMPORTS	3	29	17

*Proven domestic reserves of natural gas recently rose more than 30 percent. While this indicates a potential for domestic natural gas production, natural gas price regulation -- effective through 1985 -- will discourage production.

**Maintenance of domestic crude oil production at current levels is regarded by many industry observers as unlikely. To achieve this 1990 production level will likely require use of enhanced recovery techniques.

The *optimistic* scenario charts a situation in which the Nation would successfully undertake massive energy supply initiatives. Under this scenario, three quads of energy will have to be imported. While this level of energy imports would be 81 percent below the 1979 level (16 quads), nevertheless it represents continuing, partial dependence upon foreign energy sources.

At the other, *pessimistic* extreme -- where physical, technical, regulatory and other supply constraints are not overcome -- U.S. energy imports would stand at 29 quads. This would represent -- were the oil available -- an 81 percent increase over the 1979 energy import level and would result in substantial world oil price increases. It would worsen the U.S. balance of payments position, accelerate domestic inflation, depreciate the dollar and contribute to a reduction in the rate of growth of national output, employment and real income. Add to this the implications for national security, and it is clear that this pessimistic domestic energy production scenario must not be allowed to materialize.

The *most likely* course is one in which domestic supply initiatives are aggressively pursued, but technical, regulatory and market constraints are not fully overcome. In this case, 1990 energy imports would stand at 17 quads, representing a 6 percent increase in energy imports over 1979. In 1990, the United States would *still* be dependent upon foreign sources for 18 percent of the energy it consumes.

Scenarios outlined in Table 2 differ because of assumed 1990 production levels of oil, coal, nuclear power and "other" energy sources.

The *optimistic* case assumes coal production would rise from its 1979 level of 18 quads to 30 quads in 1990. A 67 percent increase in coal production would require that environmental, transportation, regulatory and technical problems be resolved. In addition, it would involve the balancing of many, sometimes conflicting goals. For example, allowing railroads to charge higher rates so as to enable them to improve roadbeds and rolling stock will increase the cost of transporting coal. If -- as a result of this increased cost -- huge amounts of foreign coal were substituted for domestic coal, there would be insufficient demand to support a domestically-produced supply of 30 quads.

The *most likely* domestic production scenario assumes that efforts are made to come to grips with problems of this sort and that, as a result, coal production rises to 22 quads.

The *optimistic* 1990 nuclear electric output is six quads. To achieve this level of output would require that all currently halted or delayed nuclear construction -- whether short-term or long-term delays -- be completed, and that almost all nuclear stations currently under construction permit review would be approved.

Under *most likely* conditions, few construction permits would be approved, but currently delayed or halted construction would be completed.

Included in the *other* category are synthetics, solar, geothermal and other forms of energy. Because of technical, economic and other constraints on energy production from these sources, achievement of the *optimistic* 1990 production of seven quads is most unlikely. While the *other* forms of energy offer significant long-term potential, they can make no meaningful contribution until the latter part of this century. At best, the next two decades are expected to see the emergence of various small scale demonstration projects designed to provide options among emerging energy technologies.

At least until 1990 -- and probably until the end of this century -- the United States will be too reliant upon insecure foreign energy sources. Allowing even for a 67 percent increase in coal production, a 100 percent increase in nuclear generation, a 10 percent increase in domestic oil production, and a 700 percent increase in other sources of energy by 1990, the United States would have to import about three percent of its energy under an energy independent scenario.

What happens after 1990 is largely dependent upon policies and programs put in place during the 1980's. There is no question that broad-based investment in energy conservation in the 1980's has the potential to reduce considerably the amount of energy required per unit of real GNP produced. Investment in more energy efficient plant and equipment, homes, appliances, and automobiles can reduce the growth rate of energy consumption by 25 percent or more during the 1990's.

Assuming this level of success in energy conservation efforts, a 4.0 to 4.5 percent growth rate of GNP could be achieved with an approximate 1.5 percent annual increase in energy consumption. The welcomed combination of increasingly efficient energy use and rapid economic growth could mean that the United States will consume about 110 quads of energy by 2000.

Under energy independent, *optimistic* conditions, domestic energy production in 1990 would be approximately 92 quads. Even under optimistic conditions, therefore, elimination of import dependence by the year 2000 would mean that domestic energy production would have to increase 18 quads in 10 years, an unlikely prospect.

Assuming continuing research efforts on enhanced oil recovery during the 1980's, domestic crude oil production could make some contribution. Precisely how big a contribution will be made cannot be known with precision because many of the technologies are immature and require several years following their application in specific wells to yield substantial results. Nevertheless, any contribution will be important because the United States will, in the 1980's and 1990's, remain dependent upon liquid fuels for transportation.

Given the continuing role of liquid fuels, synthetic fuels production which adds to the liquid supply will be increasingly important. The role of synthetics, however, will be contingent upon the mobilization of production techniques developed during the 1980's which makes synthetic fuels research of high priority during this decade.

The burden of additional energy production of synthetic fuels will fall most heavily on coal and to a smaller extent on biomass resources for alcohol production. And, a maximum national effort to mobilize these technologies immediately is in order. Coal has a large role to play, as well, as an industrial and powerplant boiler fuel, both to backout oil and to fill the gap in electric generating capacity suggested by the reduced growth in nuclear energy output capacity.

The preeminent role suggested by coal during the remainder of this century has been formalized in recent months by the Administration and Congress. Passage of the Energy Security Act in June is a watershed event in natural energy planning. This legislation establishes synthetic fuel production targets of at least 500,000 barrels of oil equivalent daily by 1987 and a full 2 million barrels daily five years thereafter. Some $20 billion is initially made available to attain these national targets, with the promise of an additional $62 billion to follow if justified by progress in synthetic fuel technologies.

While the establishment of a national energy program is an impressive and necessary step, it does not guarantee success in substantially reducing domestic dependence on foreign oil. More must be done. In addition, the nation cannot afford to wait for this coal-based national strategy to succeed. Other steps should be taken to reinforce the policy direction established in the Energy Security Act. Above all, the nation cannot afford to defer until the 1990's decisions that should be made in the 1980's.

II
ENERGY CONSUMPTION

An appreciation of the nature of the U.S. energy problem depends upon an understanding of certain facts that relate both to the demand for and the supply of energy. On the demand side, the United States continues to be oil-dependent, and it is increasingly dependent for that oil on OPEC. Trends are:

- Despite the Arab oil embargo, U.S. energy consumption continues to be petroleum intensive. In 1979 -- just as in 1973 -- 47 percent of the energy consumed in the United States was petroleum. But the percent of petroleum consumption imported from abroad jumped from 36 percent to 44 percent.
- Imported crude oil has become an increasingly important source of the petroleum consumed. In 1973, 54 percent of net energy imports consisted of crude oil. By 1979, crude oil constituted 80 percent of U.S. net energy imports. (Because of the increase in U.S. refining capacity, part of the increase in crude oil imports is attributable to the displacement of refined product imports by domestically produced products.)
- In 1973, 48 percent of U.S. petroleum imports came from OPEC countries. By 1978 -- five years after the embargo -- OPEC was the source of 69 percent of U.S. petroleum imports.

Energy consumption by specific private sector has been changing in response both to market forces (in the form of higher real energy prices) and in response to tax and other conservation incentives. Between 1973 and the end of 1979, output of the industrial sector increased 22 percent, while energy used by the industrial sector increased only 0.007 percent. In essence, industry produced 22 percent more with the same amount of energy. This contrasts with an increase in energy use by the residential-commercial sector of 10 percent, and with an increase of 4 percent by the transportation sector -- demonstrating the impact of market constraints on industry costs not present in transportation and households.

In relative terms, industry has used less energy, while the residential-commercial and transportation sectors have used more. The net effect has been an increase in total energy consumption. However, the increase has some positive features:

- Total U.S. energy consumption rose by only 4.8 percent during the entire period, 1973-1979. This compares with a compound annual growth rate of energy demand of 4 percent during the period of 1960-1973. In this sense, aggregate conservation activities have been successful.
- Energy consumption per constant GNP dollar declined from a 1973 average annual rate of 60.4 to 54.5 thousand Btus in 1979. Energy consumption has, therefore, become more efficient.

The data suggest, then, that:

- Since 1973, the United States has learned to use energy more efficiently, with the industrial sector providing the major conservation impetus.
- Despite relatively successful conservation efforts, total domestic energy consumption has risen.
- Incremental energy consumption is increasingly dependent upon imported oil, with OPEC the critical supplier. This dependence highlights the importance of enhanced domestic production and increasingly intensive conservation efforts; efforts that have been notably successful in the industrial sector.

III
ENERGY SUPPLY

While energy consumption has risen, domestic energy production has barely increased. Domestic crude oil and natural gas production -- two energy sources that were price controlled -- have actually declined.

In 1973, domestic crude oil production constituted 31 percent of all the energy produced in the United States, while dry natural gas contributed 36 percent of total. By 1979, domestic crude oil's share had fallen to 29 percent and natural gas provided only 30 percent. Even as coal, hydroelectric and nuclear-generated electricity increased, they were largely offset by declines in domestic crude oil and natural gas production. The net effect was a slight increase in domestic energy production from 62 quads in 1973 to 63 quads in 1979.

The virtually stagnant domestic energy production -- accompanied by an increase in energy consumption -- resulted in net energy imports rising from 13 quads in 1973 to 16 quads in 1979, nearly all of which took the form of petroleum products. This again illustrates the critical role of conservation. Had these efforts not been implemented, energy imports would have been significantly higher.

The energy problem is complicated by the failure to distinguish between the world's stock of oil and the oil released from that stock. The world possesses huge oil reserves, but new oil discovery rates have declined, and there are technical, economic, political and institutional constraints on world oil production.

The prognosis for sluggish or declining world oil production is reinforced by a consideration of production prospects in the United States, other industrial countries, the developing countries and OPEC:

- *United States:* Despite increased investment in exploration and enhanced recovery in the lower 48 States, proven reserves have fallen in America -- the only major country to domestically control prices. Since 1973, reserve additions have been about half as large as production. These facts, coupled with the plateauing of

North Slope production, mean the U.S. domestic production will continue to decline -- unless the Nation pursues an aggressive enhanced oil recovery program or new fields are discovered.

- ***United Kingdom:*** North Sea production will peak in the early 1980's. Barring discovery of new fields, output will begin to fall in 1983 or 1984. (Norway is already restricting North Sea production).

- ***USSR:*** Available evidence indicates that in the next three or four years, the Soviet Union -- the world's largest oil producer -- will become a net importer of oil. A reversal of the recent production slow-down would depend upon the discovery and development of new oil fields, but the impact of any new finds would not be felt before the early 1990's. The emerging Soviet dilemma is of particular concern because the USSR will be pressured not only by domestic consumption requirements. It is also committed to satisfying the growing needs of Eastern block countries and of Cuba and Vietnam. With domestic oil production declining and demand growing, the USSR will be an increasingly aggressive competitor for access to Persian Gulf crude. This has implications not only for the world price of oil, but for national defense well.

- ***Developing Countries:*** Substantial increases in oil production will be realized, as is already visible in Mexico, Egypt, India, Iraq and Malaysia. However, most of the incremental supply will be diverted to support increased oil consumption in those producing nations and/or offset increased consumption in other LDCs.

- ***Mexico:*** Current Mexican efforts contemplate raising oil production to roughly 4 million barrels per day in the early 1980's. (This contrasts with current domestic consumption rates of approximately 1.1 million barrels per day). Some qualified judgments hold that higher production rates are technically feasible, but there are social and political effects to consider. Mexican officials are concerned about potentially disruptive effects of excessive domestic spending of oil revenues. There is also concern that the accumulation of large foreign exchange reserves would appreciate the peso and erode export competitiveness. However, the proximity of Mexico to the United States offers great potential for mutually beneficial trade and other arrangements. The same is true, of course, for Canada -- though there the quantities that may become available for U.S. purchase in the 1980's seem more limited.

- ***OPEC:*** There are both policy and technical constraints on oil production in OPEC countries. Technical constraints result from increasing interest among OPEC producers in maximizing the recovery rate of their reserves. (For technical reasons, no more than

12 to 15 percent of a deposit can be extracted in a given year without damaging the reservoir. Faster withdrawal rates reduce the extractability of the remaining deposit.) There are also policy constraints that reflect the producers' perceptions of their relatively limited absorptive capacities. Of particular concern is the desire to avoid domestic spending that has both inflationary and socially disruptive potential. Additional concern centers on the wisdom of accumulating massive financial assets and on the desire to conserve light crude.

Regardless whether secure and/or insecure import sources are utilized to provide oil to American consumers, there must be a growing realization in this country that the value of being an oil-export country is increased *if* production of oil is reduced. Exporting countries are increasingly realizing that they can reduce production of a non-renewable energy resource while the price of oil rises, and that the end result will be increased oil revenues with less production.

It is a simple case of being able to produce less but earn as much or more annually over a longer period of time because the unit price increases with or without increased demand. This means that exporting countries are able to elect to take advantage of an option that is always available to the producer of a product whose demand will not change much even if there are price increases for that product.

It is an action that is not likely to cease. The exercising of this option by exporting countries -- regardless how offensive it is perceived to be in the world community -- should serve as an impetus to produce and to conserve more domestic energy.

IV
CURRENT U.S. ENERGY POLICIES

Oil Policy

Following the 1948 discovery of vast Middle East oil reserves, the central focus of U.S. energy policy was the allocation of an oil surplus. The Mandatory Oil Import Program (MOIP) sought to control oil imports by issuing import quotas to each U.S. refiner.

The availability of inexpensive foreign oil and the excess producing capacity in the United States and Canada brought forth an era of declining real energy prices, leading to the emergence of oil as the world's dominant fuel.* There was an inexorable rise in world demand for oil which ultimately led -- during the period 1969-72 -- to the evaporation of the U.S.-Canadian surplus. When the surplus began to disappear, the price of Persian Gulf crude rose.

As the world price of oil went up, the price of domestic crude was frozen in 1971 under edicts of the broader Nixon freeze on wages and prices. A two-tiered system was established to encourage production from new domestic wells. This was part of a decontrol process to bring prices of domestic oil more in line with imported crude and to combat the oil embargo.

Under the two-tiered system, new domestic oil could be priced at cost, as could imported oil. (New oil was defined as oil produced from an established leasehold at a level above recorded production in 1972.) At the same time, Congress deregulated stripper well crude, which has been defined as oil produced by wells yielding less than 10 barrels per day, allowing its price to rise to world levels.

Congress' tentative move toward decontrol was reversed with passage of the Energy Policy and Conservation Act of 1975 (EPCA). The result was a three-tiered pricing system on:

- Old oil (lower tier) -- approximately $5.25 per barrel. Old oil was defined as oil produced from a leasehold which was equal to or less than 1972 production.

---

*During this period of declining real energy prices, some efforts were undertaken to shore up the price of domestically-produced crude oil.

- New and stripper crude (upper tier). The price of this oil was set at $11.28 per barrel.
- Imported oil, whose price was whatever the market would bear.

From this system came the establishment in 1975 of $7.66 per barrel as the average weighted price for domestic crude. (The weights reflected the fact that 60 percent of U.S. production was old oil.) This national policy restricted the price of domestically produced crude and constrained domestic production. The reliance on foreign oil escalated until 1979, when a combination of rising prices and domestic policy initiation trimmed the surge in oil imports which began in 1975.

In a world in which foreign crude oil suppliers are becoming increasingly capricious, a system of price controls subsidizes oil imports and penalizes domestic production -- not only of oil, but of natural gas as well.

Alaskan North Slope crude began flowing in mid-1977. Under the price control program, this oil -- about 1.2 million barrels per day -- must be sold at upper-tier prices. West Coast refineries are capable of handling only one-half of this oil. The remainder must, by law, be sold somewhere in the United States.

Transportation to the Gulf Coast refinery complex is the best available alternative, but this increases costs. There are additional costs, as well. Gulf Coast refiners process the Alaskan crude with equipment which was not designed to refine low gravity high sulfur Alaskan crude. Refinery cracking units are designed to refine certain types of oil to produce certain quantities of product ranging from gasoline to asphalt. Using existing equipment to refine the high sulfur oil, refiners obtained a product mix that contained a larger quantity of residual fuel oil (such as boiler fuel) than would have been obtained from lower sulfur crude.

Greater supplies of residual oil went on the market and by mid-1978 prices fell to as low as $1.50 per million Btu. This came at a time when unregulated intrastate natural gas was costing about $2 per million Btu. Buyers turned to residual fuel oil, and production of natural gas fell. Natural gas producers left available gas in the ground, and approximately 2 billion cubic feet of gas per day that could have been produced under more competitive conditions was preserved for later use.

Natural Gas Policy

Between 1945 and 1970 natural gas was the fastest growing major energy source in the United States. Early in the 1950's the Federal Government developed two parallel natural gas systems -- an *interstate* system and a smaller *intrastate* system. The interstate system was regulated at the wellhead (at the point of production in the field) by the Federal Power Commission (FPC). In 1959 the FPC established an area pricing program whereby price ceilings were determined by the average cost of gas production in certain areas of the country. This led to wide price disparities which discouraged production of harder to obtain natural gas supplies.

After 1970 the natural gas industry's growth rate began to decline. Reserve additions (excluding the Alaskan North Slope) had fallen below production in every year since 1967. The tight energy supply situation was further complicated by the oil embargo.

Even as crude oil prices rose, the FPC gas price ceilings remained the same. The spread between rising oil prices and controlled natural gas prices increased, and there was an increasing incentive for energy consumers to substitute natural gas for oil. Meanwhile, there were no price incentives for natural gas producers to provide more gas and a shortage resulted.

In an attempt to mitigate the natural gas shortage, the FPC in 1974 abandoned area pricing and set higher ceiling prices. However, by the time new prices went into effect, crude oil prices had risen even higher. Natural gas prices were still well below the price of petroleum, and gas production was constrained. Subsequent price ceiling increases by the FPC consistently failed to keep pace with residual fuel oil prices.*

The Natural Gas Policy Act (NGPA) of 1978 attempted to resolve these regulatory problems. The intent of the Act was to maintain natural gas prices which would be closer to the price of competing residual fuel oil. Natural gas production and exploration activities have expanded robustly since 1978 in anticipation of complete decontrol by 1985.

Because crude oil prices continue to rise faster than regulated natural gas prices, the stage remains set for additional, regulatory-induced shortages of domestically produced natural gas between now and 1985, when decontrol of the natural gas industry is to take effect.

Coal Policy

Coal is relatively abundant in the world in general, and in the United States in particular, where it is believed a 300-year supply exists.

---

*The FPC was steadfast in its efforts to provide adequate price incentives for new gas. Unfortunately, the price of imported oil consistently rose faster than the FPC regulated price of natural gas.

Regulation of the domestic coal industry has centered on environmental impacts of both mining and burning of coal, worker health and safety, and transportation.

In the case of environmental impacts, sulfur emissions associated with coal burning have been of particular concern. When the Clean Air Act regulations were written in 1970, the presumption was that the use of a new emission control process, flue gas desulfurization (FGD), would encounter no technical or economic impediments. It now appears that its cost will preclude its use by many existing coal-fired plants. Insofar as its cost makes the conversion of a power source from gas or oil to coal prohibitively expensive, reliance on the FGD process contributes to continued U.S. dependence upon foreign oil. The lack of adequate coal handling and storage facilities also contributes to this dependence.

The transportation of coal from the western United States is also a major policy question. Railroads are the primary means of coal transportation, and slurry pipelines are potential competitors. (Slurry is a mixture of coal powder and water or some other fluid medium.) While new rail lines would generally not have to be built, it is nevertheless true that slurry pipelines have a capital cost advantage because they cost about one-half as much to build as do new rail lines. Pipelines also have an operating cost advantage because their associated labor costs are about one-half those of operating a railroad. Yet, a frequently cited disadvantage is that slurry pipelines require large amounts of water from the western coal regions where water is scarce.

While it is possible to use brackish water from deep underground wells, the potential environmental effects are as yet undertermined.

Nuclear Policy

Between 1973 and 1979, electricity consumption increased at a compound annual rate of 3.1 percent, roughly four times as fast as total energy consumption. Because it is so flexible in use, and because it can be produced using so wide a variety of fuels, electricity could be viewed as an increasingly important option for domestically produced energy. But if electricity is to continue to play its increasingly important role, more generating capacity must be brought on line. It is for this reason that solutions to the problems of nuclear power should be pursued.

In 1979 nuclear electric power provided 11 percent of the electricity consumed in the United States, or 4 percent of total domestic energy production. Nuclear stations had a capacity of approximately 51 gigawatts in 1979. This is enough electrical generating capacity to supply 51 cities with populations of 600,000 each.

Although nuclear electric power has been the fastest growing domestic energy source, regulatory lags (especially during the certification process) and other factors have affected both nuclear stations under construction and those that have entered the licensing process. Factors include deteriorating financial conditions of many utilities and increasingly uncertain electricity demand forecasts. In addition, events such as Three Mile Island -- and increasing concern with nuclear waste storage -- have reduced the level of acceptance of the nuclear option. This has had, and is expected to continue to have, the effect of reducing the inclination of electric utilities to seek certification of new nuclear stations.

Nevertheless, in an era of increasing U.S. dependence on increasingly volatile foreign oil sources, the nuclear option provides national energy relief if the problems of nuclear power are solved and its large-scale use accepted. There are 33 gigawatts -- fully 65 percent of existing nuclear generating capacity -- "waiting in the wings." This is capacity that has been approved but whose construction has been delayed or halted. And, there are 29 gigawatts -- or 57 percent of existing nuclear generating capacity -- under construction permit review by Federal and State agencies.

If the acceptability problems of nuclear energy persist, they reduce the probability of this capacity being on-line before 1990. However, if construction of the 33 gigawatts "waiting in the wings" were to be completed, nuclear energy production would rise by 65 percent -- from three quads in 1979 to five quads in 1990. If, in addition, the 29 gigawatts under construction permit review were to be approved and built, capacity would increase to almost seven quads. Adding 33 gigawatts of nuclear capacity has the potential to save two quads of petroleum energy, and adding the additional 29 gigawatts could save another 1.8 quads of petroleum energy. Based on the 1979 energy import level of 16 quads, the decision to bring all 62 gigawatts on-line could result in more than a 23 percent reduction in imported oil reliance. This is the equivalent of 684 million barrels of oil per year which could be used by the liquid fuel dependent transportation sector. Even with today's relatively energy inefficient vehicle fleet, this would be about an 80 day supply for America's transportation sector.

This is not to say that an equivalent number of barrels will be backed out from the use of nuclear power and necessarily used in other energy sectors. It is to say, however, that growth in any sector - - whether it be population, industrial, residential or business -- will require some amounts of additional energy. It seems only prudent that growth be first dependent upon the most secure forms of domestic energy, and secondly upon the most secure forms of imported energy. This long range staff study has adopted the belief that for the better part of the next 20 years increased energy consumption -- regardless the amount -- is most likely to be satisfied by pursuit of goals which bring increased domestic supplies.

The potential role of nuclear energy is great if problems can be overcome, especially when the technical and economic constraints on synthetic fuels production are considered.

The future of nuclear power depends on solving the spent fuel and waste problems which are the back-end of the fuel cycle. Spent fuel pools are filling up. Utilities must either expand their storage facilities -- including away-from-reactor (AFR) facilities if the political problems can be solved -- undertake reprocessing, or shut down reactors.

Commercial reprocessing is an option which must be pursued. Spent fuel is not waste. Only a small percentage of uranium is consumed in a nuclear reactor. This rich spent fuel can be reutilized. Since 1977, however, commercial reprocessing has been banned because of fear of terrorist theft of the freed plutonium. The security problems can, however, be overcome. The Europeans are overcoming their problems and are proceeding rapidly with reprocessing. The United States must do likewise.

If so, nuclear energy can save substantial amounts of oil, making nuclear and coal alternatives for the 1980's.

Electric Utility Price Regulation

At a time when domestic energy production must be afforded the highest priority, the regulatory process has impeded the growth of the Nation's electric utilities. While the effect has been most pronounced in the case of nuclear generation, the regulatory process has had a deleterious effect on conventional power generation.

Traditional utility rate regulation is based upon historical costs. In general, rate increases are allowed only to the extent that they can be justified on cost-of-service grounds -- that is, to the extent that the increase in revenues generated by the higher rates does not exceed increases in operating costs, depreciation on plant and equipment, and a fair or reasonable rate of return on investment. Cost increases are, however, determined based upon experience during a prior test period. As a result, utility rates change only after *past* cost changes have been recorded, and then only after a lengthy administrative process.

All of this is of little consequence when costs are falling, but in an inflationary environment, the *lag* of rate adjustments behind costs has meant that earned rates of return have been systematically pushed below allowed rates of return. As a consequence, electric utility investment has declined, increasing the probability of power shortages in the 1980's.

A regulatory climate that takes account of the realities of surging inflation and of the Nation's precarious dependence on foreign energy sources is vital.

Synthetic Fuels Policy

The tight world supply of conventional oil forces attention on synthetic fuels production. The natural raw materials for synthetic fuels production are heavy oil, tar sands, oil shale, coal and lignite.

The United States has vast quantities of these oil-like substances. Known reserves of tar sands and heavy oil total about 320 billion barrels. Oil shale reserves total 1,790 billion barrels, 20 times the amount of oil produced in the United States since 1948. The United States possesses coal and lignite equivalent to about 780 billion barrels of oil.

The magnitude of these reserves is further apparent when it is considered that in 1978 world oil consumption totalled 23 billion barrels, and that world coal output was the energy equivalent of about 11.5 billion barrels of oil. The most accessible U.S. shale oil contains 20 billion barrels of recoverable oil. Just this lowest cost deposit could support a 2.5 million barrel per day output for about 22 years.

While these numbers are impressive, even the richest deposits of oil-like substances are extremely high cost relative to current oil prices because:

- Quite apart from plant costs, an expensive infrastructure would have to be built.
- Oil shale production is labor intensive, requiring from 1,500 to 3,000 employees for each 100,000 barrel per day plant.
- Scarce western water would have to be diverted from other uses.
- Where surface mining is feasible, the volume of spent rock residue is 20 percent greater than that of the original shale.
- Because most of the deposit is located underground, the long-term technology is likely to be on-site recovery which

eliminates the spent rock problem, but is a much more expensive production process.

This is not to say that the private and/or social costs of synthetic fuels production are prohibitive. As the world price of oil continues its inexorable rise, more synthetic projects will become marginally attractive. Already, Exxon Corporation is nearing a decision to launch commercial-scale projects to produce synthetic fuels from the lower cost deposits in Colorado and Texas.

While benefits and costs to the Nation must be carefully weighed, the potential role of the Federal Government in synthetic fuels production is great. The Federal Energy Regulatory Commission (FERC) recently approved construction of the first commercial facility for the production of synthetic natural gas from coal. A consortium of five companies is participating in the project.

FERC's approval of the project allows all gas produced by the consortium to be rolled in with the prices of other natural gas. This means the consortium's customers will pay higher prices for the gas they purchase and participate in subsidizing the development of synthetic fuels.

FERC's approach prompts debate about alternative means of financing synthetic fuels production. Alternate plans are available in the quest for the Nation's energy independence. Another, perhaps more appropriate, approach would be for the Federal Government to guarantee purchase at guaranteed prices, until production is demonstrated to be economically feasible. In this manner, all American taxpayers would be participating in the program, the risk would be spread nationally, and the commercialization process would be accelerated.

Solar And Other Renewable Energy Sources

Solar energy -- while admittedly a providor of very little energy at present -- is a long-range source potential which deserves the financial and pioneering support of Americans. Unlike crude oil, natural gas and coal, solar is a renewable energy source whose contribution may only be limited by the imagination and research devoted to its development.

This study fully recognizes the long-range potential of solar energy, but does not project that it will contribute significantly before the turn of the centruy. The desired scenario would be that solar energy development prove that projection wrong, and that solar energy take its place among the major energy sources.

It should be recognized, however, that during 1979 the estimated amount of usable energy from all solar collectors installed in the United States was roughly one one-hundreth of one percent of the energy produced in the country during the year.

Looked at another way, if solar energy is to contribute as much as one quad to the Nation's energy supply, the stock of solar collectors must increase one hundred-fold. Costs would be massive, and a full scale project will command large amounts of the Nation's economic resources. The best way to provide for these mammoth costs is to provide more conventional energy in the interim while development of solar energy sources progresses.

This staff study projects 12 quads of energy from renewable energy sources would be possible by 1990 under optimistic conditions (Table 2). The projection includes 5 quads from hydroelectric sources and 7 quads from "other" sources, including solar, wind, geothermal, biomass, wood, forests and crop wastes. This optimistic projection accords with the results suggested by other studies.

The Potential Of Gasohol

While gasohol -- the blend of about one part alcohol with nine parts unleaded gasoline -- is no panacea for America's energy or agricultural problems, it may in some regions gain importance.

There is debate as to whether more energy is required to produce ethyl alcohol than the alcohol contains as a fuel. However, even if present techniques have negative energy balance, the use of coal or biomass fuels to produce ethanol will directly reduce oil imports on a barrel for barrel basis, will make gasoline supplies more secure, and improve fuel efficiency.

Gasohol or even pure alcohol fuel can be directly substituted for imported oil. Limiting its growth is the availability of the feedstock -- corn is currently most commonly used -- for the manufacture of alcohol, and availability of gasohol distributors. Currently, gasohol made from ethyl alcohol -- derived from agricultural products and combined with 90 percent regular unleaded gasoline -- qualifies for the four cents per gallon Federal motor fuel excise tax exemption. In 1980 a reported 2,000 service stations sell gasohol; however, some major companies refuse to distribute it. Still, the volume of gasohol sales has grown to an annual rate of 120 million gallons per year in 1979, a small percentage of the 107 billion gallons of motor fuel sold in 1979.

Modest gasohol use is unlikely to involve a major trade off between fuel and food. A recent study by Congress' Office of Technology Assessment has concluded that one or two percent of U.S. gasoline consumption can be provided by alcohol without a significant impact on food and fuel prices.

Enhanced Oil Recovery

Up to 40 billion barrels of oil in the United States that are not presently recoverable could be produced with enhanced recovery techniques. A program of enhanced oil recovery could significantly reduce dependence upon foreign sources by increasing domestic crude oil production.

Primary and secondary petroleum recovery techniques extract only 25 to 30 percent of petroleum from reservoirs. The remainder -- about 300 billion barrels in the United States -- remains too closely adhered to surrounding surfaces for natural field pressures or waterflooding to extract. It is from this remaining deposit that up to 40 billion barrels of oil could be extracted.

While enhanced oil recovery is expensive (costing from $10 to $32 per barrel), it is technically feasible. Indeed, in recent years, enhanced oil recovery provided about 265,000 barrels per day. In the future, about half of the 40 billion barrels could be extracted using gas and steam injection. The other half would require the use of more expensive chemical technologies.

Because present technologies are so expensive, and because technological improvements are still on the horizon, Federal research into enhanced recovery should be accelerated.

If domestic oil discovery rates remain at present levels, enhanced oil recovery is the only available means by which domestic oil production can be increased.

V
ENERGY AND STAGFLATION

Stagflation -- the simultaneous occurrence of high unemployment, slow growth, and accelerating inflation -- is a much-discussed and very serious problem. However, it is not without solution. Appropriate public policy can be formulated if there is an understanding of the stagflation process, and knowledge of the role played in that process by -- among other things -- the price of energy.

The present inflation has no single cause. It is attributable to a host of variables ranging from excessive monetary growth and government regulation through increases in the price of imported oil.

Between 1973 and 1980, the prices of every category of industrial commodity -- the materials used to manufacture goods -- increased substantially. The price of energy increased most dramatically. Between 1973 and 1980, the prices of fuels and related products and power rose 274 percent, driving up the costs of production.

While increases in energy and other input prices pushed up producer costs, real disposable incomes declined. This meant that the post-1973 wave of anticipatory buying -- buying in anticipation of future price increases -- had to be financed out of savings, and by massive consumer credit increases. Thus, two forces were (and are) at work: (1) a demand effect which tends to increase output, and (2) cost increases which tend to reduce output. Cost increases tend to dampen increases in output and employment that otherwise would have occurred. This is especially true because businesses are now less inclined to produce for inventory.

While simultaneous increases in demand and cost have opposite effects on output (and therefore on employment), they are both inflationary.

In a stagnant economy, capital investment is retarded. As a result, as the population and labor force have grown, more and more labor has had to be accommodated by an essentially fixed and increasingly obsolescent capital stock. Evidence is strong that labor has been substituted not only for expensive energy, but for physical capital as well. While this has helped more people find jobs -- and while it is partly responsible for the massive increases in employment realized in the post-1973 years -- the process of labor substitution does impose a cost. It has the effect of reducing productivity and of increasing producer costs -- both of which contribute not only to current inflation, but to future inflation. This, in turn, reduces the competitive position of U.S. industry.

The analysis does not suggest that demand management is the answer. The stagflation problem -- and the problem of long-term economic growth -- involves perverse incentives, along with institutional, technical, and financial constraints on production, employment and capital accumulation. It is, in short, a supply-side problem.

Policies designed to reduce effective demand are not the answer. Rather, the solution is to be found in policies that reduce producer costs, increase productivity, encourage saving and investment, and that eliminate incentives to produce less rather than more. All of this has basic relevance to the energy sector where public policy has heretofore been particularly inappropriate. Enhanced energy conservation is a laudable goal whose contribution cannot be minimized. However, conservation -- by itself -- cannot provide the answer either to the energy problem or to the stagflation problem. The United States must appeal to the other half of the scissors. It must encourage the domestic production of energy, and it must find ways to dampen the effects of energy price increases on consumers and producers.

Deregulation of domestic energy prices appears to be the only means by which both energy conservation and energy production can be encouraged. It is precisely because domestic energy prices have been regulated that energy consumption has been encouraged even as energy production has been discouraged. This has played directly into the hands of the OPEC cartel.

Energy price deregulation will serve to dampen future OPEC price increases. Energy price deregulation should not foster any additional acceleration of energy price increases; it should work to reduce future price increases. In this way energy price deregulation will result in the growth of real incomes and of productivity.

VI
POLICY RECOMMENDATIONS

The growth rate of domestic energy consumption depends upon: (1) the rate of growth of real GNP, and (2) the amount of energy used per unit of real GNP.

Under full-employment conditions, the rate of growth of real GNP is dependent upon: (1) the rate of growth of the labor force, and (2) the rate of growth of productivity. The U.S. labor force -- which will increase between 1.0 and 1.5 percent annually until 2000* -- is therefore a crucial consideration.

To attain a growth rate of output per employed worker of approximately 3 percent per year will require an increase in output of 4.0 to 4.5 percent per year. This implies a significant increase in energy consumption.

The 3 percent growth rate of output per employed worker is not arbitrarily chosen. It is believed to be in the range of growth that is necessary if inflation is to be reduced, employment is to increase, the living standards of all Americans are to be increased, and the competitive position of the United States is to be restored. However, even if viewed only as an illustration, it serves to make the point that a growth rate of output per employed worker of 3 percent per year requires an increase in energy consumption of a least 2.0 percent per year.

The present configuration of energy supply will not accommodate this growth rate of energy consumption. Indeed, if no domestic energy supply initiatives were undertaken, accommodation of a 2.0 percent annual growth rate of energy consumption would, by 1990, require a 100 percent increase in energy imports (over the 1979 level). This level of energy dependence would not only be dangerous; it could not be sustained.

---

*This assumption range is based upon firm demographic data plus the assumption of a continuation of present labor force participation. However, should immigration run much higher, or should continuing inflation force higher labor force participation, the labor force would grow faster.

A "do-nothing" energy production policy is one extreme. At the other extreme is an "optimistic" domestic energy production scenario that would reduce 1990 energy imports to roughly 19 percent of the 1979 level (Tables 1 and 2). In both cases, considerable success in energy conservation is assumed. Given this range of choice, public policy should be formulated with the following facts in mind:

(1) A target 3 percent per year productivity growth rate must be considered in the context of continued expansion of the labor force.

(2) Attaining a goal of this magnitude is constrained by restrictive policies on the growth rate of energy supply.

(3) Of particular concern are constraints that impinge not only on the growth rate of energy supply, but on the growth rate of output as well. Regulatory and tax policies that impede the saving and investment process are particularly harmful. Restrictions on saving and investment reduce the growth rate of output per employed worker, a measure of productivity. This, in turn, has the effect of exacerbating inflation and reducing the competitiveness of U.S. exports.

(4) Massive investment in energy production and conservation will serve the dual purpose of reducing the Nation's import dependence and of driving up real incomes and productivity.

With these considerations in mind, policy recommendations are:

A. To Encourage Conservation and Domestic Energy Production:

1. The phased decontrol of oil and natural gas prices should, at minimum, remain on schedule; and the acceleration of the decontrol of natural gas should be encouraged. As the real price of energy rises, domestic production from vast stocks of heavy oil and geopressurized natural gas will become more economic, as will the use of enhanced oil recovery (EOR) techniques. Given the potential for domestic oil production using EOR techniques, Federal research efforts in this area should be expanded.

2. Both to encourage the development and use of more energy-efficient equipment and to provide an incentive to invest in energy-producing equipment, the investment tax credit should be increased.

3. As the real prices of oil and natural gas rise, the production of synthetic fuels will become more economic. The Federal Government should accelerate this process by embracing the concepts of

risk and cost-spreading. The energy problem should be treated as a national problem whose resolution will require the absorption by all taxpayers of both risks and costs. All taxpayers -- as opposed to the customers of particular energy suppliers -- should share in the risks attendant to synthetic fuels production. Government programs should stress the simultaneous exploration of many competitive concepts which are, at first, small scale to reduce the probability of getting locked into any specific approach or resource. As a general rule, however, the private sector can be expected to move ideas from the laboratory to the market place more efficiently than can the government. The orientation of the Federal Government should therefore be toward the encouragement of private commercialization. To this end, the Federal Government should establish a program of purchase and price guarantees for synthetic fuels production. The Energy Security Act, which recently became law, is a step in the right direction.

4. Efforts to solve the problems of increased use of coal and nuclear power should be vigorously pursued. Coal and nuclear power should be viewed not only as energy sources, but as substitutes for oil.

a. The Federal Government should intensify research efforts designed to reduce the cost of coal pollution abatement.

b. In the case of nuclear power, the Federal Government should develop more secure waste storage facilities and clarify low level radiation hazards. In addition, the Federal Government should encourage the commercial reprocessing of spent nuclear fuel.

c. The Federal Government should more closely monitor the construction and operation of nuclear generating facilities to ensure that they operate under the safest conditions possible. In addition, site approval controversies and construction delays affecting nuclear plants may in the future prompt a stronger Federal Government role aimed at eliminating layers of regulation which impede safe nuclear energy supplies.

5. In the case of utility price regulation, permissible rates of return should be based upon current rather than historical costs.

B. To Encourage Access to Alternative International Energy Sources:

1. Conversion from insecure foreign crude to Mexican and Canadian oil and natural gas should be a goal of Federal policy. U.S. negotiations with Mexico and Canada should be

comprehensive in the sense that both energy and non-energy issues -- notably immigration -- are considered.

2. The United States should encourage oil and natural gas exploration in the less-developed countries. Technical assistance and the equity participation of U.S. enterprise should be encouraged.

3. The United States should, however, not lose sight of the intrinsically risky nature of any foreign energy dependence. With this in mind, the Strategic Petroleum Reserve should be built up, and provision should be made for adequate withdrawal rates from the Reserve.

C. To Encourage Saving and Investment:

1. In part to stimulate energy production and energy-efficient investment, and in part to offset the effects of higher energy prices, businesses should be permitted faster tax writeoffs on capital equipment. Tax writeoffs should, as nearly as is administratively possible, approach current replacement costs.

2. To encourage saving, which is a source of investment finance, tax rates on unearned income and on capital gains should be reduced.

3. Because energy availability is the key to the growth and competitiveness of the U.S. economy, the Federal Government should adopt a posture that is not only congenial to but supportive of the growth of the energy industry. Regulatory initiatives and tax policies should take account of the national character of the energy problem. They should be designed to foster a climate that encourages investment in energy and energy-related projects.

VII
MATERIALS

America's mineral industry -- an industry whose growth and vigor is vital to the economic health and vitality of this country -- is even more dependent upon foreign countries than is the oil industry. About 44 percent of the petroleum consumed in the United States comes from foreign sources, but there are some major materials for which the United States is dependent on foreign sources for more than 80 percent of its supply.

The seriousness of this dependence for materials is partially seen when it is considered that the supply of specific materials will have an effect on America's success in improving its energy conservation efforts.

For example, the fuel-efficient automobile can provide one of the measures of escape from the OPEC petroleum trap. Ironically, the minerals needed to develop that new vehicle may land the United States in a second trap and a different kind of foreign control. Platinum, cobalt, chromium and manganese are not -- like oil -- generally known to be among the economy's necessities, but they are critical. They are considered essential to the industrial system.

America's aerospace industry has already confronted this new trap in the case of cobalt. Because it can withstand extremely high temperatures and is weldable, cobalt alone can satisfy certain needs in jet engines. Yet, jet engine manufacturers are dependent for cobalt supplies from four nations -- Russia, Cuba, Zaire and Zambia. Paralleling the trend in oil, except worse, cobalt has risen from $6 per pound in 1977 to about $25 in 1980, with prices during the past year leaping as high as $50.

The auto industry's need for platinum has provided an early warning also. This critical metal is doubly important because it is used in the process of converting crude oil into gasoline and in the manufacturing of catalytic converters. The United States is heavily dependent for platinum group metals on foreign sources, especially Russia and South Africa.

Yet, a far greater minerals challenge is facing the auto manufacturers. Fuel efficiency is related to weight, and the old cast iron block will have to give way to lighter materials if a 50 mile per gallon vehicle is to be achieved. One of three possibilities being considered is plastics which has the disadvantage of being petroleum based. A second is aluminum whose production unfortunately requires an enormous energy expenditure and whose principal ingredient, bauxite, is already subject to prices which border on attempted cartel manipulation. The third possibility is high strength-low alloy steels which are lighter, but regrettably require such foreign dominated materials as chromium and manganese.

Hence the double trap: The escape from OPEC, aided by more fuel efficient autos, could put the transportation system under the threat of a potential minerals cartel.

Recent Trends

As with goods and services and forms of energy, there has been an erosion of incentives to produce and invest in the domestic mineral industry. The decline of the domestic mineral industry is itself both a symptom and a cause of slow economic growth, and public policy -- domestic and foreign -- has been a major catalyst to the industry's decline.

Recent trends in the mineral industry indicate increasing demand, decreasing capacity, and resulting rising imports:

- The Bureau of Mines has forecast an annual 3.5 percent growth in demand for copper between 1975 and 2000; yet, no major new smelter or refining capacity is likely before 1985. Moreover, imports of refined copper have risen over the last 10 years, from 6 percent to over 19 percent of U.S. consumption.
- The United States consumes about one-fifth of annual world zinc production. The construction and transportation industries account for about two-thirds of domestic zinc consumption. Despite the Bureau of Mines forecast of an annual 2 percent growth in demand through the turn of the century, U.S. zinc production capacity has declined. The closing of eight plants has reduced domestic capacity by almost 50 percent. This decline in capacity has been accompanied by increased imports of zinc metal which have risen 89 percent since 1969.
- While imports of chromium and manganese ores for use in making ferroalloys have declined, imports of ferroalloys have increased substantially. (Ferroalloys -- primarily mixtures of iron

and some other metal -- impart distinctive qualities such as hardness or corrosion resistance to steel, cast iron and aluminum).

Factors Affecting the Investment Decision

The image that emerges is that of an industry in decline -- an industry whose productive capacity is shrinking despite increasing product demand. U.S. mineral producers have been confronted with an erosion of cash-flow resulting primarily from a rapid escalation of costs. The result has been a steady decline in the average rate of return on invested capital, coupled with a rapid build-up of debt-equity ratios.

For a capital intensive industry, this has a double-edged effect. The erosion of current and projected cash-flows has the effect of reducing the incentive to invest in plant and equipment. At the same time, it lessens the ability of a mineral producer to secure outside financing. Therefore, both the incentive and the ability to invest in plant and equipment are reduced.

Cost increases can be traced to many causes. Government policy, for one, has played a significant role in increasing both the operating and the capital costs of the domestic mineral industry. The government has promulgated strict environmental regulations, restricted joint ventures designed to pool resources and to spread risks, and imposed worker health and safety requirements. (There is no doubt that regulation generates benefits. The point is, however, that regulatory initiatives also impose costs.)

Regulatory activities are particularly important in the mineral industry -- a high risk industry characterized by high fixed costs and product price volatility. To the extent that regulatory initiatives add to uncertainty, they impede investment in an already risky industry. In addition to the rapid cost escalation which has reduced mineral industry investment, the domestic mineral industry now faces the prospect of increasingly uncertain revenues.

Cyclical variation in demand will always confront the industry. This is not new. What is new is an emerging trend on the part of foreign governments -- particularly those of the developing countries -- to own and or to subsidize their domestic mineral industries. In particular, foreign governments are increasingly inclined to subsidize domestic mining operations during periods of slack demand. With employment maintenance in mind, foreign governments stand ready to make up the difference when product price falls below unit costs. As a result, foreign mineral production has displaced the output foregone by U.S. producers who, without benefit of direct subsidies, reduced production. The prospect of increased, subsidized competition makes projected revenues less secure. This, in turn, makes investment in the domestic mineral industry less attractive.

Mineral industry investment is also constrained by limitations on the use of Federal lands for mineral exploration, and by the absence of a comprehensive U.S. energy policy. Because the transformation of ores into metal requires large quantities of energy, restrictions which delay or halt construction of electrical generating facilities are of particular concern.

In summary, rapidly escalating costs, foreign government subsidization of their own mineral industries, restricted access to Federal lands, and the lack of a coherent energy policy have all contributed to the decline of the U.S. mineral industry.

Increased Reliance on Foreign Sources

Declining domestic capacity can be reconciled with increasing domestic demand only by an increase in mineral imports. This would occur for two reasons: (1) imports would be the only available supply source as demand increases relative to domestic supply, and (2) domestically produced ores and refined products would become expensive relative to foreign products.

Increased reliance upon foreign sources raises the question of the potential for the emergence of an OPEC-style cartel. However, this prospect is considered unlikely because of the varied materials involved, the ability in some cases to substitute one mineral for another, and because of the differences among producer nations in political, social and economic values. Moreover, as has been emphasized, many of the producer nations tend to maintain production levels even when demand is depressed. The emergence of a minerals cartel is therefore not likely. Yet it is a possibility that cannot reasonably be dismissed.

The United States is dangerously dependent upon foreign sources for a number of critical materials. (See Table 3.) While the list is not exhaustive, it shows the potential for supply disruptions. In each case the materials listed in Table 3 are critical. Their use is essential in the production of products ranging from basic steel through jet engines, airframes, and missiles. In some cases, the USSR is the principal U.S. supplier. In the event of civil strife or sabotage in volatile South Africa, the USSR would, in some cases, be the only available U.S. supplier.

TABLE 3
U.S. Import Dependence: Eight Key Minerals

Material	Import Reliance (Percent of Total Consumption)	Major Import Source(s)
Chromium	92%	USSR South Africa
Cobalt	97%	South Africa
Platinum-group metals	91%	South Africa USSR
Columbium	100%	Brazil, Thailand, Nigeria, Malaysia
Fluorspar	82%	South Africa
Manganese	98%	Gabon South Africa
Bauxite	93%	Jamaica, Australia Surinam, Guinea
Titanium	*	USSR is the largest producer of titanium "sponge", the semi-processed metal. Japan, Britain and China also produce titanium "sponge". Canada and Australia are major producers of titanium ore.

*Import reliance withheld to avoid disclosing individual company confidential data.

Materials listed in Table 3 are used for the following purposes:

Chromium -- Resistant to corrosion and oxidation, it is used in stainless steel; no know substitute.

Cobalt -- Because it imparts such qualities as heat resistance and superior magnetic properties, cobalt's end uses include transportation, electrical equipment, machinery, and paints, chemicals and ceramics.

Platinum-group metals -- Useful as chemical catalysts and to impart corrosion resistance. Used in the automobile, chemical, electrical and petroleum refining industries.

Columbium -- Used in high-strength, low-alloy steels; in stainless steel, in superalloys (alloys used in high-temperature applications such as jet engines), and in ceramics in high-temperature applications.

Fluorspar -- Used in steel production, fluoro-carbons and fluorine compounds, and primary aluminum.

Manganese -- Used in the production of iron and virtually all steels.

Bauxite -- The only raw material used in the production of alumina, from which aluminum is produced. Also used in aluminum refactories, chemicals and abrasives.

Titanium -- In 1978, 60 percent of titanium sponge metal was used in jet engines, airframes, and space and missile applications. Of the remainder, about half was used in chemical, power generation, and marine and ordnance applications, and half in steel and other alloys. For aircraft and space uses there is essentially no substitute.

The situation calls for programs designed to increase U.S. mineral production and -- where domestic production is not possible -- to reduce the risks associated with import dependence. A prudent buildup of the strategic stockpile is not considered feasible at this time. However, as an illustration of the stockpile shortage, only 32,000 tons of titanium are currently stockpiled, as compared with a goal of 130,000 tons. Cobalt reserves are 22,000 tons short of the 43,000 ton target.

The possibility of mineral supply disruptions is not, however, the only concern. Whether supply disruptions emerge or not, rising mineral prices are virtually certain, because the prospect for mineral industry investment is poor. In the developing countries, the ownership of mineral industries has shifted toward host governments and away from multinational mining firms. Many producer nations, therefore, no longer have access to the specialized skills of experienced mining enterprises. In particularly short supply is knowledge of exploration technology, professional management and -- perhaps most important -- the capacity to obtain outside financing. In effect, the developing countries have embarked upon a course that virtually ensures their inability to expand significantly production capacity.

Increases in mineral demand coupled with sluggish capacity growth means that U.S. importers will have to pay progressively higher prices for the minerals they buy. This is so even though world mineral stocks are large and mineral cartels are not likely to emerge. What is worse, unless prices rise fast enough to compensate for cost increases, increases in demand will not provide sufficient incentive for net domestic investment. Therefore, reductions in the rate of increase of producer costs are essential -- both as a stimulus to current domestic production and as a catalyst to net investment.

The Terms of Trade and U.S. Economic Growth

As mineral imports increase, they will contribute to U.S. balance of payments difficulties. The negative effect on the trade balance will be greater as domestic mineral industry production decreases.

From 1951 to the early 1970s, the United States enjoyed a favorable shift in the terms of trade. That is, the prices of raw materials and energy declined relative to the price level. In effect, the price of imported goods declined relative to the price of U.S. exports. This trade posture was a catalyst to growth; it was an engine whose driving force allowed incomes to grow faster than living costs, and provided an increased standard of living in America.

This pleasant state of affairs came to an abrupt end at the close of 1973. Fueled by increased crude oil prices, the rise in import prices accelerated inflation, reduced real incomes and dampened economic growth.

If the United States is to return to an accelerated growth path, it must come to grips both with the fact that the terms of trade have shifted, and with the fact that government policies have made the attendant problems manifestly more difficult. The problems of energy and of materials are problems whose resolution requires the marshaling of policies designed to increase investment in those industries.

VIII
POLICY RECOMMENDATIONS

The U.S. materials problem is primarily one of assuring that minerals critical to the production of goods and services and to the national defense are available in sufficient supply. In formulating policy, decisionmakers should consider that:

(1) The U.S. mineral industry is in decline.

(2) A major catalyst to the decline has been the deleterious effects of public policy on industry revenues and costs.

(3) To increase both current output and investment in the domestic mineral industry, policies should be designed to reduce both current and anticipated producer costs.

(4) The United States is dependent upon the USSR and other tenuous sources for many of the materials critical to its industry and to the national defense.

With this in mind, policy recommendations are:

To Encourage Domestic Mineral Industry Production and Investment:

1. The investment tax credit should be increased.
2. Mineral industry producers should be permitted faster writeoffs on capital equipment.
3. The Federal Government should establish a policy to ensure that the minerals industry has access to adequate energy supplies.
4. In the case of environmental standards, the Federal Government should enforce performance rather than design standards. This will encourage both the employment and the development of cost-effective pollution control techniques.
5. Federal lands should be made more accessible to mineral exploration and development in a fashion consistent with the interests of local citizens.

Contents of Volume

The following outline contains a list of titles and authors of papers which will appear in the final printed volume of the Energy and Materials section.

A. The Economics of Energy
   1. U.S. Energy Demand in the Next 15 Years: A Skeptical Evaluation of Prognosis (Oscar Gass, Consulting Economist)
   2. Real Energy Prices and Future Economic Growth (Michael Deutch, Consulting Economist)

B. Supplies of Non-Energy Materials
   1. The U.S. Mining and Mineral Processing Industry: An Analysis of Trends and Implications (U.S. General Accounting Office)
   2. A Report on the Potential of Supply Dislocation for Selected Non-energy Materials (Lee Murphy, P & L Murphy Associates)

Authors of Selections

MICHAEL DEUTCH, *Consulting Economist*
OSCAR GASS, *Consulting Economist*
THE GENERAL ACCOUNTING OFFICE
LEE R. MURPHY, *P&L Murphy Associates*
(Authors' Biographical Data will appear in permanent volumes.)

Contributors of Peer Review

ROBERT AYRES, *Carnegie-Mellon University*
JAMES GRIFFIN, *University of Houston*
FRANK HUDDLE, *Library of Congress*
BEN LOVE, *Texas Commerce Bancshares, Inc.*
STEPHEN McDONALD, *University of Texas at Austin*
JOHN SAWHILL, *New York University, Deputy Secretary, DOE*
W.A. VOGELY, *Pennsylvania State University*

The Energy and Materials section of the Special Study on Economic Change, Joint Economic Committee, is one of 10 sections to be released over the next several weeks. Final printing later this year will include all areas of the special study. Orders for this Energy and Materials study may be placed by contacting:

Special Study on Economic Change
Joint Economic Committee
Room 1537
Longworth House Office Building
Washington, D.C. 20515
Telephone: (202)225-3565

Research and Innovation:

Developing a Dynamic Economy

Joint Economic Committee

Special Study on Economic Change

A staff study

December 1980

The Joint Economic Committee's Special Study on Economic Change (SSEC) was inaugurated under the leadership of then Chairman Hubert H. Humphrey (D.-Minn.), together with Senator Jacob K. Javits, (R.-N.Y.), ranking Minority Member.

The study progressed through Mr. Bolling's chairmanship and into the leadership of Senator Lloyd Bentsen (D.-Tex.), chairman; and Congressman Clarence J. Brown (R.-Oh.), ranking Minority Member. The goal of the SSEC is to chart the major changes in the economy and to analyze their implications for policymakers.

JOINT ECONOMIC COMMITTEE

LLOYD BENTSEN, Texas, *Chairman*
RICHARD BOLLING, Missouri, *Vice Chairman*

SENATE

WILLIAM PROXMIRE, Wisconsin
ABRAHAM RIBICOFF, Connecticut
EDWARD M. KENNEDY, Massachusetts
GEORGE McGOVERN, South Dakota
PAUL S. SARBANES, Maryland
JACOB K. JAVITS, New York
WILLIAM V. ROTH, Jr., Delaware
JAMES A. McCLURE, Idaho
ROGER W. JEPSEN, Iowa

HOUSE OF REPRESENTATIVES

HENRY S. REUSS, Wisconsin
WILLIAM S. MOORHEAD, Pennsylvania
LEE H. HAMILTON, Indiana
GILLIS W. LONG, Louisiana
PARREN J. MITCHELL, Maryland
CLARENCE J. BROWN, Ohio
MARGARET M. HECKLER, Massachusetts
JOHN H. ROUSSELOT, California
CHALMERS P. WYLIE, Ohio

JOHN M. ALBERTINE, Executive Director
LOUIS C. KRAUTHOFF II, *Assistant Director-Director, SSEC*
RICHARD F. KAUFMAN, *Assistant Director-General Counsel*
CHARLES H. BRADFORD, *Minority Counsel*

Table of Contents

CHAIRMAN'S INTRODUCTION i
Senator Lloyd Bentsen
RANKING MINORITY MEMBER'S INTRODUCTION iii
Rep. Clarence J. Brown
I. INTRODUCTION 1
II. THE IMPORTANCE OF INNOVATION 7
III. INVESTMENT NECESSARY FOR INNOVATION . . 13
IV. THE ROLE OF SMALL AND LARGE COMPANIES. 25
V. FACTORS AFFECTING INNOVATION 29
VI. POLICY IMPLICATIONS AND RECOMMENDATIONS 33

SPECIAL STUDY ON ECONOMIC CHANGE

LOUIS C. KRAUTHOFF II, *Director*
GEORGE D. KRUMBHAAR, Jr., *General Counsel*
BILL R. MADDOX, *Editor*

RESEARCH AND INNOVATION:
Developing a Dynamic Economy

Staff Study Prepared Under the Direction Of:
MARY JANE MADDOX
Project Director, Research & Innovation

Staff Study Project Associate:
MARGARET BLASZEK, *SSEC*

Technical Studies Prepared Under the Direction Of:
WALTER HAHN
Congressional Research Service
Area Director, Research & Innovation

Contributing Director:
CHARLES SHELDON
Director of Research

Research Assistant:
SANDRA ADAMS, *SSEC*

CHAIRMAN'S INTRODUCTION

Senator Lloyd Bentsen

Chairman, Joint Economic Committee

American ingenuity has done more than anything else to shape the quality of the entire world economy and especially of life in the United States. Technological innovation paved the way for unparalleled progress -- creating jobs, advancing productivity, prompting gains in real income and our rise to a premier position in international markets.

This country has a remarkable record of success when we have set priorities and worked toward their achievement. The United States -- with contributions from industry, government and universities -- leads the world in agriculture and has made impressive advances in many other areas, such as the development of the computer. Our national enthusiasm for progress enabled us to put a man on the moon within less than a decade after making the commitment.

The following staff study emphasizes that today's commitment to research is tomorrow's realization of a better life; that from ideas come practical developments which can spawn benefits across the Nation. This study is a call for a rededication to the successes of America's creative genius.

Many examples of U.S. progress resulting from research and development are cited in the study. Agriculture is perhaps the best since government initiative is well documented, dating back to the Civil War period when land-grant colleges were established.

At that time, a farmer could feed himself and two or three others. But by World War II, the farmer had increased his output four to six times. The 1980 farmer feeds about 65 people at home and abroad. In a 10 hour day, 250 people previously could pick by hand the same amount of corn which one modern, self-propelled combine can harvest and shell today.

Our role in space and its positive effects are sources of national pride. From space exploration has come improved communications, agriculture and weather forecasting. In 1965, when the first communication satellite was launched, it could carry 240 telephone calls at the same time. By the late 1970's, improved satellites could handle 6,250 calls simultaneously. The next generation of satellites will each be capable of transmitting 12,000 to 14,000 telephone calls at once. Satellites provide information which helps management of existing natural resources and the discovery of new sources of minerals and energy.

Industrial innovation is at the core of the economic well-being of the United States and is a major contributor to economic growth. Innovation helps combat inflation. It stimulates productivity, employment and the ability of U.S. products to compete both in domestic and world markets.

As the study points out, American industry -- through technological innovation -- maintained for decades a steady flow of new and better products and services to the world marketplace. Ever larger numbers of people were employed and the United States dominated the international markets with its technologically-superior products. In fact, 30 to 40 percent of the economic growth in the United States during the past three decades has been attributed to industrial innovation.

This study reminds, too, that the decade of the 1980's promises to be a period of considerable challenges as we attempt to restore stable prices, our international competitiveness, productivity and strong employment. If encouraged and properly marshalled, technological advances can help lead the way.

But, in a sense, we will be playing catch up because R&D efforts of the United States have declined when compared to the past and when compared to other countries. Investment in plant and equipment has been sluggish over much of the last decade and the focus of government policy and thus of corporate management has been on the short term rather than on long-term goals.

Meanwhile, other countries have learned from our past experiences and have devoted greater amounts of their nations' resources to research and development. Between 1964 and 1978, for example, the U.S. share of gross national product (GNP) devoted to R&D had declined 23 percent. Japan's had increased 30 percent and Germany's 50 percent.

Evidence presented in this study shows that the wealth of our past accomplishments would not have been possible without the cooperative efforts of government, industry and universities. Although technological innovation is inherently a private sector enterprise, government affects innovation in major ways.

Through the provision of necessary incentives and the removal of innovation barriers, government can help return to the forefront the spirit of American ingenuity which can lead us -- as it has in the past -- through the challenges of the future.

Ranking Minority Member's Introduction
CONGRESSMAN CLARENCE J. BROWN

This study outlines the connection between research and innovation and the Nation's economic expansion and standard of living and, in particular, productivity growth and international competitiveness. Technological innovation in the form of new products and more efficient production processes has been the basis of both a sustained rate of economic growth and of an improving standard of living.

The role of research and innovation is pervasive. Evidence suggests that companies which spend heavily on research and development (R&D) increase productivity 75 percent more rapidly than do other firms. Other data indicate that firms which invest heavily in developing technology and carry it forward into commercial products have nine times the employment growth and one-sixth the price increases of firms with relatively low R&D investment. U.S. exports of such high technology manufactured goods as aircraft, computers and telecommunications equipment outpaced imports of similar products throughout the 1970's. Indeed, one of the bright spots for the United States internationally has been agriculture, where R&D has greatly influenced productivity.

At the time of the civil war a farmer could feed himself and two or three others. But because of advances in farm equipment, better fertilizers and pesticides and seed improvements, the 1980 farmer can feed 65 people at home and abroad. Partly because of these R&D-induced increases in productivity, the United States was able in 1979 to export agricultural products valued at about $35 billion, accounting for more than 19 percent of U.S. exports.

Research and innovation has fostered employment growth, slowed the rate of increase of product prices, enhanced the competitive position of U.S. industry, and it has been a major catalyst to economic growth. Thirty to 40 percent of the economic growth experienced in the United States during the last three decades has been attributed to productivity increases brought about by research and innovation.

These are impressive numbers. Yet, during the 1970's the productivity gains that had for so long been an engine of economic growth for the United States steadily eroded. Workers in other countries, notably in Germany and Japan, are pushing closer to U.S. output per manhour on a total basis and far exceed us in annual rates of increase. At the same time, the U.S. share of the world market for technology-intensive products has dropped and America's high technology products have not been as successful in third world markets as in the past.

The causes of this erosion not only of our competitive edge but of our standard of living are not hard to find. In most industries new machinery is needed to employ the latest technology. Yet, net investment -- plant and equipment purchases that result in an expansion of the Nation's capital stock -- fell from an annual rate of 7.4 percent in the 1960's to 1.8 percent in the 1970's. Meanwhile, constant dollar spending on R&D has been virtually stagnant. Having reached a high of $29.8 billion in 1968, R&D spending did not again reach that level until 1977, with the 1980 figure expected to be in the neighborhood of $33 billion. Just as important, the composition of the R&D spending that does occur is increasingly oriented toward the quick payoff; toward the modification of existing products rather than the development of new products.

There is no mystery here. An environment of high and variable inflation rates, of complicated, time-consuming and sometimes capricious regulatory processes and, above all, of stop-go economic policies is simply not congenial to long-term investment. Add to this a tax system that penalizes savers, discourages venture capital investment, and provides inadequate allowances for the depreciation of plant and equipment, and we have a recipe for disaster.

Investment in new knowledge, in human capital and in plant and equipment is at the core of our economic well-being. It is time we put in place policies that encourage rather than discourage investment; that encourage saving rather than consumption, and that enable both businesses and consumers to make decisions unencumbered by "fine tuning," unnecessary regulations and intolerably high tax and inflation rates.

RESEARCH AND INNOVATION:
Developing a Dynamic Economy
I
INTRODUCTION

Predictions of the 1940's foresaw a need for no more than 1,000 computers in the world by the year 2000, but today -- two decades before the turn of the century -- there are millions of computers ranging from large conventional models through minicomputers, microprocessors and computers-on-a-chip.

Forecasters did not expect the computer would be out of the laboratory and into industry by the early 1960's or that by the late 1960's the computers would begin to shrink in size and grow in speed. Computer development in industry has come so far that in 1980 computers allow robots to perform routine, repetitious work on assembly lines. Efforts to make computer components smaller have been so successful that the intricacies of 45,000 transistors can be crammed on a tiny chip the size of a contact lens. The chip functions as a special purpose microcomputer and can perform over a million additions and multiplications per second. Computer technology has advanced so rapidly that the modern pocket calculator is more powerful than the first bulky, room-size computers which were owned primarily by the Federal Government.

Computer technology advanced because computers were improved, prices were lowered, and enterprising people found widespread and diversified uses for them. The history of one vital component of computers -- semiconductors -- shows how both government's and private industry's financial support spurred progress. During an 18-year period, industry spent $1.7 billion on semiconductor work and the Federal Government contributed $702 million. Industry provided marketing, production and technical know-how, while the U.S. Government promised to be a large-volume customer for the resulting products. The role of the government as a buyer is often a stimulus to innovation because the certainty of contract purchases lessens the risk in the evolution of fledgling technologies. The contribution of universities to semiconductors and other technology development is critical, too --

both in basic research and in the education of personnel. Often it is government's relationship with universities through funding which enables universities to provide the environment for such training.

While the United States Government stimulated the demand for computer technology through contracts and purchases, it played a more direct and primary role in agriculture and space technologies, both areas in which the government has long-term, national commitments. The government put its powerful shoulder to the wheel of those technologies and pushed for their development through contributions of money, people and support. The government's initiative in agriculture dates back to the Civil War period when the land-grant colleges were established. At that time a farmer could feed himself and two or three others, but by World War II, the farmer had increased his output four to six times. The 1980 farmer feeds about 65 people at home and abroad -- because of advances in an array of industrial support such as mechanized farm equipment, better fertilizers and pesticides, and seed improvements. A sophisticated farm implement today can till 60 times more land in one hour than a yoke of ox-drawn plows of yesteryear. In a 10-hour day, 250 people previously could pick by hand the same amount of corn which one modern, self-propelled combine can harvest and shell today. A national commitment to agricultural development encouraged these advances because the national policy recognized both the value of research and development and the need to disseminate the resulting technical information quickly. Domestically, the establishment of the Cooperative Extension Service hastened the spread of new ideas and techniques to farmers. On the international front, P.L. 480, the Agricultural Trade Development and Assistance Act of 1954, and other programs rejuvenated the Foreign Agricultural Service and set the stage for the "green revolution".

The government also was the impetus for space exploration which is already benefitting society through better communications and practical applications of information from space. In less than a quarter of a century, the United States has not only landed a man on the moon but also extended space technology to improve communications, agriculture and weather forecasting. In 1965 when the first communication satellite was launched, it could carry 240 telephone calls at the same time. By the late 1970's, improved satellites could handle 6,250 calls simultaneously. The next generation of satellites will each be capable of transmitting 12,000 to 14,000 telephone calls at once. Another group of satellites is currently used for agriculture -- to forecast yields of wheat in the

United States, the Soviet Union and Canada, and to assess conditions of crops and forests. Weather-oriented satellites give information which helps manage water resources. Data from satellites represent a new source of information for geologists looking for minerals and energy sources. Now, because of technological advancement, space exploration is about to be linked with several American companies in a partnership to pioneer new work in space. On a space shuttle set to depart in April, 1981, several companies have either leased laboratory facilities or cargo space. Projects for the companies range from production of pure silicon crystals to rare enzymes to materials processing. Officials at the National Aeronautics and Space Administration say the space shuttles are booked through 1984.

The history of computer, agriculture and space technologies illustrates the value of cooperative efforts in which industry, government and universities work toward positive, technological goals. Exchanges of ideas, information and personnel speed the progress of innovation. Oftentimes, one technology depends upon elements from another technology in order to evolve. Computer technology, for example, has interacted in a vital role with space and to a lesser degree with agriculture. The computer is basic to space history because without computers there could have been no first landing on the moon for the United States in 1969.

Modern agriculture is taking advantage of the computer to inform the farmer of plant development and to predict growth stages before they happen. This transfer of computer technology to agriculture occurred because the government used lines of communication to farmers established through a century of cooperative efforts.

In order to reach the present point in computer development, it took the joining of electronics, optics, crystallography, plasma physics and polymer chemistry. In more recent years, surface physics and chemistry have become important along with work in miniaturization, plasma etching and superconductivity. Applications for computer technology have increased many-fold since the first big computer was used to count the population of the United States in the 1950 Census. The computer history, however, is no different from any other scientific breakthrough, major innovation or technology advancement. Work in basic and applied research was followed by the development phase and during all three stages there was sufficient investment to allow the work to progress in an encouraging, future-oriented environment.

Through investment, inventive individuals -- working independently or for a company -- obtain the financial backing which enables them to pursue their research and development. Investment provides the facilities not only for actual research work but also for the plants and tools to transform the innovative idea into a marketable product. And it is investment through education which equips individuals with the knowledge and skill to engage in R&D work.

Today's investments in research and innovation will help forge tomorrow's economic and social course. Industrial innovation is at the core of the economic well-being of the United States and is a major contributor to economic growth. Innovation influences inflation, stimulates productivity, employment and the ability of U.S. products to compete both in domestic and world markets.

For decades, American industry -- through technological innovation -- maintained a steady flow of new and better products and services to the marketplace. Ever larger numbers of people were employed and the United States dominated the international markets with its technologically-superior products. Productivity of workers and factories expanded, permitting the United States to keep pace -- or in many years outdistance -- the rate of inflation, an accomplishment which distinguished this country from most other industrialized nations. America exported a greater volume of products and services than it needed to import.

Technological innovation is a key element in future economic vitality. It will help determine the U.S. standard of living -- both economic and social. Technology does not decide social structure but it does provide choices.

Innovation and technological progress are woven into the fabric of United States history. Because of technological developments, America has changed the focus of its worklife from agriculture to industry to services and is now on the brink of the information age. During the early years of U.S. history, the country's resources -- workers and funds -- were invested in farming. In contrast, by 1980 about 72 percent of employment was in the service sector. It is significant that while the bulk of the labor force is concentrated in service employment, the 3.5 percent of U.S. workers in agriculture supply enough food for more than 220 million Americans and to lead the world food market. Mechanization and other innovations enabled farms to produce more food with fewer employees and changed the structure of U.S. society -- from rural farmers to urban industrial workers. Through the years society profited from the technological changes, but often at the expense of displaced workers. Society's challenge is *not* to denounce change because it *is* change, but rather to share the responsibility and benefits of such technological changes with the individual workers through training programs and policies aimed at easing the transitions.

Declining productivity growth and high inflation marked the U.S. economic scene during the 1970's. The United States lost ground in the international marketplace and could not maintian a favorable trade balance for most of the post-1973 energy crisis period. Factors contributing to the listless economic pace included a slowing rate of innovative activity and lower levels of investment -- both in terms of finances and R&D personnel. As a ratio of gross national product (GNP), the United States invested less in research and development than it had in the past. U.S. expenditures for R&D, relative to GNP, were on the decline while those of major economic competitors such as Japan and Germany increased. The United States spent less than competitors, as a percent of GNP, to build new manufacturing facilities and equip them with cost-cutting machines and tools. At times during the 1970's, venture capital -- the type of investment which launches and expands innovative firms -- was difficult to obtain. Other countries increased their share of scientists and engineers in their labor forces while the U.S. share declined.

The rate of technological change relies both on the rate of discovery of innovations and on the availability of financing to convert them into such products as fuel-efficient automobiles and improved silicon chips which hold increasingly greater amounts of information. The performance of innovation is important because 30 to 40 percent of the economic growth in the United States during the past three decades has been attributed to industrial innovation. Studies show that technological advances increase productivity for R&D-oriented industries, create more jobs and improve the ability to compete internationally. Many positive aspects of the United States' position in international markets are seated in the technological superiority of U.S. products. In foreign markets, the United States held its lead in high technology manufactured products during the 1970's, although there were signs of erosion. The U.S. share of world market for technology-intensive products has dropped, and America's high-technology goods, in comparison to those of other industrialized countries, were not as successful in third world market regions as in the past. This intense international competition promises to continue in the 1980's.

The historical success of U.S. high-technology industry is a pattern which should not be ignored. It is a pattern of success which should spur government and business alike to support R&D investments and policies which expand the economy.

Both small and large companies have shaped American history with inventive ideas which led to new products and to different and more efficient ways of performing work. Some of these innovative accomplishments are recorded in this staff study which also pinpoints some government, university and industry successes which placed the United States in a worldwide leadership role in technology. This study outlines the connection of research and innovation to this Nation's standard of living and economic expansion, and, in particular, to productivity growth and international competitiveness. While the R&D efforts of the United States have declined relative to the past, this study concludes that cooperative approaches by both the private and government sectors can improve the inventive climate of the country. Sufficient investment in research and development facilities and activities, plant and equipment and in people will be necessary to restore the vigor of innovation.

II

THE IMPORTANCE OF INNOVATION

Productivity

The American worker is still the most productive in the world, but U.S. workers are now increasing output per hour at a slower rate than in previous decades. Workers in other countries, particularly Germany and Japan, are pushing closer to the U.S. worker output per hour:

- The German worker who produced 40 percent as much as an American worker in 1950 advanced output to 88 percent of the U.S. level in 1979.
- For the Japanese worker, output rose from 16 percent of the U.S. amount in 1950 to 66 percent in 1979.

The gap is closing so rapidly that if present trends continue, German workers will outproduce U.S. workers within six years. Japanese workers, however, would need 13 years to pull abreast of U.S. output at current rates.

Each decade since 1950 has resulted in decreasing gains in productivity in the United States where the growth rate of productivity has ranked behind every one of its major trading partners. Output per hour growth for all goods and services produced for the 1970's was 1.4 percent per year, compared to 3 percent during the 1960's and 2.6 percent during the 1950's.

Productivity growth for U.S. manufacturing workers during the 1970's expanded at a rate less than half that for Japanese workers, and in Germany, productivity growth was even higher than Japan's as shown in Table I (A), on Page 8.

The sagging rate of productivity growth has as one of its many causes a slowing pace of innovative activity. Machinery and process innovation is one factor which contributed to the productivity gains by German and Japanese workers. As shown in Table I(B), on Page 8, in recent years both Germany and Japan have invested more heavily in new plant and equipment than the United States.

Plant and equipment investment is a vehicle to spread innovation and is critical to technological progress. New machinery is usually needed to manufacture new products and utilize improved processes. Research and development, with its accompanying new ideas and discoveries, leads to the need for plant and equipment investment. R&D is not the only factor which contributes to output improvement, but many experts attribute 30 to 40 percent of the

TABLE IA

Productivity Growth, Manufacturing Only

	Average for 1970's
United States	2.2
Japan	4.7
Germany	5.4

TABLE IB

Plant and Equipment Investment as a Percent of GNP

	Average for 1970's	High For 1970's
United States	10.2	10.8 (1979)
Japan	16.9	21.0 (1970)
Germany	12.6	14.7 (1971)

TABLE IC

Percent GNP Devoted to R&D*

	1964	1978	% Change In Share 1964--1978
United States	3.0	2.3	-23
Japan	1.5	1.9	+30
Germany	1.6	2.4	+50

TABLE ID

Personal Savings as a Percent of Personal Disposable Income

	1970	1978
United States	7.4	4.9
Japan	18.1	20.1
Germany	14.6	13.8

---

* Not all countries allocate R&D funds to the same goals. Latest data available show the U.S. spent one-third of *all* R&D funds on defense and space, while Japan expended virtually nothing in those categories and Germany's expenditures were only 8 percent.

economic growth in the last three decades to innovation. The Department of Commerce studied high technology companies for 1957-73 and determined those R&D-oriented firms increased output 38 percent faster than other industries. The same study showed these high technology firms created jobs 88 percent faster.

A study by Data Resources, Inc., in the late 1970's said that companies which spend heavily on research and development increase the output of their employees 75 percent more rapidly than do other manufacturers. Increases in productivity lower producer costs and lead to lower price increases than those in other industries. Cost reductions which result from higher rates of productivity generally lead to increased output and more jobs. Other figures indicate that firms which invest heavily in developing technology and carry it forward into commercial products have nine times the employment growth and one-sixth the price increases as firms with relatively low R&D investment.

Both Japan and Germany have increased R&D spending relative to GNP in the last two decades as seen in Table I(C) on Page 8. It is believed this additional R&D expenditure has contributed to productivity growth. Germany upped R&D spending as a percent of GNP about 50 percent from 1964 to 1978 and Japan's increase was 30 percent -- in contrast to the 23 percent *decline* in the ratio of R&D to GNP in the United States. The three countries also have different priorities in allocating R&D funds, and this may be a factor in productivity gains. In order to meet its major international defense obligations, the United States spends slightly more than half of government R&D funds for national security commitments. About one-third of *all* R&D spending in the United States, whether government or private, goes for defense and space. In contrast, both Japan and Germany must restrict their defense-related activities because of post-World War II agreements and most R&D spending is directed toward civilian R&D which does not include defense and space.

Another factor influencing the slowdown in productivity growth in the United States is the increasing concentration of workers in service industries where productivity growth is both harder to achieve and more difficult to measure. By 1980 about 65 million members of the civilian labor force worked in service industries in contrast to the estimated 26 million in the goods producing sector. With future expansion anticipated in the knowledge-information fields, the U.S. economy is likely to become increasingly service oriented. More Americans already work in information-related jobs than in any other field and their numbers are expected to increase.

International Competition

Innovation is one way to compete more effectively in international markets. America's position in the world market has slipped as the United States has bought more foreign products and has not balanced the purchases with exports of American goods. The cost of importing oil -- which jumped from about $3 billion in 1970 to about $60 billion in 1979 -- is largely responsible for this unfavorable shift in the balance of trade.

One of the bright spots for the United States internationally has been agriculture where R&D and technological progress have greatly influenced productivity. Because of fertilizer, farm machinery and other farming and food technology, American agricultural output leads the world. Agriculture products valued at about $35.2 billion accounted for 19.4 percent of United States exports in 1979. Agriculture is the largest single category of U.S. exports and is expected to reach $38 billion in 1980 -- up from $7 billion only 10 years ago.

Many positive aspects of the United States position in international markets, too, are centered in the technological superiority of a host of manufactured products coming from R&D-oriented industries. Economists have shown a strong connection between each industry's R&D intensity and its export performance. Industries are termed R&D-intensive because of heavy investment in research and development and because of a substantial share of scientists and engineers in their employment. R&D-intensive industries are chemicals, nonelectrical and electrical machinery (includes computers and communication equipment), aircraft, and scientific and professional instruments.

U.S. exports of R&D-intensive manufactured goods outpaced imports of similar products throughout the 1970's. Exports of high technology goods exceeded imports by $39.3 billion in 1979 -- up from $11.7 billion in 1971. While the R&D-intensive goods surplus grew markedly, the picture for non-R&D-intensive manufactured products worsened. During the 1970's, the United States imported more non-R&D-intensive products than it exported, resulting in a deficit which grew from $11.7 billion in 1971 to $34.8 billion in 1979.

While the U.S. trade balance traditionally has been strengthened by technology-intensive manufactured products such as aircraft, computers and telecommunications equipment, evidence indicates the past strength in technology-intensive products may be vulnerable -- a finding particularly troublesome because these sectors contribute most to productivity growth and to holding down inflation. The trade surplus in R&D-intensive goods was about 2½ times greater in 1975 than it had been in 1971, but gains slowed or declined in some years after the mid-1970's, suggesting an erosion of the U.S. position internationally. A hopeful sign, however, is the 1979 surplus of $39.3 billion in this category -- nearly $10 billion above the 1978 balance. Although the 1979 surplus is encouraging, part of the positive balance can be attributed to depreciation of the dollar. As other countries have increased their investments in plant and equipment, skilled labor, and research and development, the list of products in which the United States has a marked competitive advantage has narrowed. Increased competition in technology-intensive industries is beginning also. Continuing changes in the distribution of the world's resources and the increased technical effort by major competitors will likely increase international competition during the 1980's.

Technology-intensive products accounted for 48 percent of the U.S. manufacturing exports in 1977, an increase from 38 percent in 1962. Of the top 20 industries ranked as export earners in 1977, nine of those industries were technology-intensive.

A comparison of exports of several countries reveals that in 1977 exports of the United States were more technology-intensive than exports of other countries. Technology-intensive products accounted for 48 percent of the U.S. exports in 1977, compared to 41 percent for Japan and about 37 percent for Germany.

The growth of Japanese exports of technology-intensive goods, and the growing share of these exports in markets that were traditionally dominated by U.S. producers indicate that Japan's comparative advantage in technology-intensive goods has been increasing. Japan's share of the world market for technology-intensive exports quadrupled from 1962-77, while the United States' portion dropped by one-third as seen in the following table. The fact that U.S. exports still remain more technology-intensive than exports from other major industrialized countries supports the view that the United States may not have lost its comparative advantage in technology-intensive goods, but may have experienced an erosion of it.

TABLE II

Share Of World Market For Technology-Intensive Manufactured Exports

	1962	1977
United States	28.3%	18.9%
Japan	4.2%	16.1%

Exports to developing countries where the United States and its major competitors face the same market conditions is one way to measure the competitiveness of U.S. high-technology products. In 1977 the United States had 25 percent of the market for high-technology products in developing countries, holding a modest lead over Japan. The U.S. share of such markets had dropped markedly during 1962-77; Japan, however, recorded a surge of growth as its portion of the market more than tripled. The statistics in Table III support the theory of deterioration of the U.S. strength in high-technology products, but there was strong performance by the United States in the 1979 export market and whether the improved figures represent a reversal of this trend remains to be seen.

TABLE III

Share Of Developing Countries' Market For Technology-Intensive Manufactured Exports

	1962	1977
United States	46%	25%
Japan	6%	22%

Another factor for consideration in future international market competition will be manufacturing exports from developing countries. Developing countries increased their manufacturing exports from $14 billion in 1970 to $55 billion in 1977 for an average annual growth of 22 percent. Predictions based on World Bank data suggest an annual growth rate for developing countries of 12 percent for manufacturing exports through 1985. During the 1970-77 period the developing countries increased their share of the U.S. import market from 12.3 percent to 20.6 percent.

III

INVESTMENT NECESSARY FOR INNOVATION

Total Investment in R & D

The current economic climate -- characterized by change and uncertainty -- does little to encourage long-term investment in research and innovation. Relatively static R&D spending and plant and equipment investment are signs of the slowdown in research and innovation activity.

Historically, the United States has outspent all the other major industrialized countries in research and development. R&D expenditures for the U.S. traditionally equal or exceed the combined outlays of Germany, Japan and France. One way to analyze research and development activities for countries of varying sizes is to compare the percent of R&D spending of each country in relation to that country's GNP -- the total of the goods and services produced. The U.S. base of research and development effort and the level of the GNP are both much larger than those of other western countries. The Soviet Union, however, spends a greater percent of its GNP on research and development than the United States.*

As discussed earlier, the United States and its economic competitors do not spend R&D funds on the same goals. The United States allocates more of its R&D resources to defense and space than most other industrialized nations. In 1977 (the last year statistics were available for the three countries) Japan spent virtually all of its R&D funds -- 1.9 percent of GNP -- on civilian R&D with a primary goal of developing marketable products and new processes. Germany devoted 92 percent of its R&D efforts to civilian projects. In contrast, the United States spent two-thirds of its R&D total on civilian research while one-third went for defense and space.

*Comparisons of Soviet Union R&D data are particularly difficult because of differences between the Soviet Union and other nations in R&D definitions and measurements. Because of the ambiguities, trends are more meaningful than isolated data.

Total research and development spending in 1979 for the United States was $54.3 billion, 2.3 percent of the GNP. Expenditures for 1980 are expected to reach $60.4 billion -- following the trend since 1976 of expanding R&D allotments. The 1979 total R&D of $54 billion equals $32.8 billion in constant (1972) dollars.

The emphasis on research and development peaked in the United States in 1964 when R&D spending totaled 3 percent of GNP. Declines since that time have reduced R&D spending to a level of 2.3 percent of GNP. The National Science Foundation projects the United States' R&D expenditures, as a ratio of GNP, will remain near its present level of 2.3 percent of GNP at least through the mid 1980's.

As U.S. input to research and development, as a percent of GNP, has decreased from the 1964 high, both Germany and Japan have increased their budgets. In 1978, the last year for which statistics are available for the three countries, the United States' R&D outlay was 2.3 percent of GNP. Germany invested 2.4 percent of GNP for R&D in 1978, an increase from 1.6 percent of GNP in 1964. (See Table I(C), on Page 8.) Japan had upped its R&D spending to 1.9 percent of GNP in 1978 from 1.5 percent of GNP in 1964. R&D expenditures for Germany and Japan climbed sharply from 1964 through the early 1970's; however, this pattern leveled off in the late 1970's and R&D spending, as a percent of GNP, has stabilized at mid-1970 rates.

When examining United States' R&D expenditures in constant dollars, a high of $29.8 billion was recorded in 1968. After that, actual spending stagnated in real terms until 1977 when outlays again reached the 1968 level. Each successive year since 1977 has brought some increase and total R&D spending is expected to reach $33.3 billion in constant dollars for 1980 -- 10 percent above the 1977 figure of $30.3 billion.

Research and development spending is a long-term investment and because of this, effects of declines in R&D efforts may not appear immediately. Continuing stagnation of R&D work retards scientific and economic performance. Scientists who win Nobel prizes do so on the basis of research done years before and process improvements aimed at increasing productivity sometimes take many years for full implementation. The 1980 Nobel prize in medicine, for example, was a long time coming for Dr. George Snell, a retired U.S. scientist who shared the award with two other people. Dr. Snell received the award for work he *began in the 1930's*. The trio was recognized for work in typing body tissue and shedding new light on the human immune system.

Federal Support in R&D

The Federal Government provided nearly half the funds for all the Nation's research and development spending in 1979, down more than 15 percent from 1964 when the government supplied two-thirds of R&D expenditures. Estimates for 1980 show the following funding levels by sector:

• Federal Government --	48.7%
• Industry --	47.6%
• Universities --	2.2%
• Nonprofit laboratories --	1.6%

The total funds allocated to research and development from all sources in 1979 amounted to $54.3 billion and the government contributed $26.8 billion -- or $16.2 billion in constant dollars. The latter was up only slightly from the $16.1 billion Federal R&D budget in 1970. Government spending for R&D actually declined in real dollars during some years of the 1970's.

While the level of funds remained steady in real terms, spending priorities changed over the 1970's. Funding for defense and space declined over the period, although these two categories continue to draw the major portion of the government R&D budget. In 1970 the government directed 75 percent of its R&D money to defense and space, compared to 60 percent in 1979. In the 1970's, the Federal Government underscored the importance of energy research and development by expanding that portion of the budget from 4 percent to 12 percent. The increase in public support of energy-related R&D followed the 1973 energy crisis. Another priority for research in the United States is health, in contrast to other Organization for Economic Cooperation and Development (OECD) countries. The United States supplies three-fourths of total expenditures for health research by OECD countries.

In Japan and Germany, industry rather than government provides the majority of the funds for R&D. However, government support in areas other than defense and space -- particularly R&D related to economic growth -- is stronger than in the United States. While providing funds for industrial R&D, some governments also provide indirect assistance in the form of tax incentives, regulatory policies, protective tariffs, provision of funds to start new companies, and favorable patent and procurement policies. Some evidence suggests indirect support of R&D may have more of an impact on research and innovation than does direct government involvement.

In the United States, a large portion of the federal research dollar goes toward the support of basic research. The government traditionally has provided the bulk of the financing for basic research -- nearly 70 percent of such funds throughout the 1970's. In real terms, government support for basic research declined during the first half of the 1970's, but the later years have seen the Federal contribution edge slowly upward.

While such increases will help, many experts feel that funding growth needs to exceed the rate of inflation to maintain an adequate foundation for basic research where the knowledge base which underlies much future innovation is discovered. Basic research is becoming more complex as sources of major technological advances now require a deeper exploration of scientific principles with specialized facilities, larger research teams, and expensive instruments and equipment.

There is often a 20 to 30-year lapse between the basic research finding and technical application, therefore, the base for future technological innovation is being deposited now. Basic research is an essential element in maintaining the reservoir of knowledge upon which the processes of applied research, development and innovation draw.

Of total basic research performed in this country in 1978, universities were responsible for slightly over half of the work. The contributions from other segments included:

• Industry --	16%
• Federal Government Labs --	16%
• Federally funded Research and Development centers --	8%
• Nonprofit institutions --	9%

A nonprofit institution, Battelle Memorial Institute, was one of the partners in the successful development of the copying process of xerography. Beginning work on a copying process in 1935, Chester Carlson produced his first image in 1938. Using a crude demonstration device, he attempted to interest businesses to provide development funds. The companies turned him down. Carlson obtained patents on his idea by 1942, but he could not attract financial support. He came in contact in 1944 with the Battelle Memorial Institute which had been set up to sponsor new ideas. The Haloid Company, whose products were stagnating, agreed in 1947 to license and develop the process. Xerography became one of the top success stories of innovation and changed the character of business throughout the world, but it was not profitable until the early 1950's -- 17 years after its conception.

Industrial Investment in R&D

Industry more than doubled the dollars invested in research and development during the 1970's, but inflation eroded this increase significantly. The 1979 allocation for R&D of $25.5 billion by industry was about two-and-a-half times the $10.4 billion spent in 1970. Inflation, however, cut into industry's contribution and the actual gain in R&D funds amounted to 3.5 percent annually.

Private industry has steadily increased its role as a supporter of R&D in the United States so that industry's input is now almost equal to that of the Federal Government. Even with these increases, however, private industry's R&D funds as a share of GNP are smaller than those of Japan and Germany.

Of concern during the 1970's was the lack of emphasis by industry on research and development of new products; however, industry toward the end of the decade appeared to be directing more funds to new product development. The concentration of R&D funds on improvement of existing products -- rather than on development of new products -- was interpreted as a decision by industry in the 1970's to focus on short-term, return-guaranteed innovations. This attitude was blamed on several factors ranging from regulation and government policies to the desire of corporate managers to show favorable, short-term, profit-loss statements.

Both companies and industries tend to maintain R&D expenditures within a certain percentage range in relation to current sales. One 1979 survey found that industry as a whole invests 1.9 percent of its sales in research and development. The amount spent for R&D can vary substantially from industry to industry and from firm to firm within those industries. The same survey revealed that information processing (computers and peripherals) compiled the highest expenditures for R&D, 6.1 percent of sales for the industry in 1979. One-half of one percent or less of sales was spent on R&D by four industries: Tobacco, fuel, food and beverages, and metals and mining.

Consistent R&D spending patterns are maintained by larger corporations which have sizeable research and development facilities, such as General Motors, International Business Machines and General Electric. By contrast, some other companies -- such as firms involved in high technology fields -- exhibit wide fluctuations in their spending. In the semiconductors industry, spending for the entire industry averaged 5.7 percent of sales in 1979, but expenditures for firms within the industry ranged from a high of 10.1 percent of sales for Intel to a low of 1.3 percent of sales for General Instrument, according to a survey of industry.

Industrial R&D is concentrated in a few industries and product lines and in short-term, applied projects. Of the research and development work performed in industry in 1978, two categories accounted for 43 percent of the spending. They were aircraft/missiles and electrical equipment/communications. When three other industries -- machinery (including computers), chemicals and motor vehicles -- were added, the five industries accounted for 79 percent of all R&D outlay.

Not only is R&D spending centered in a few industries, the expenditures are concentrated in a few firms within those industries. Although there were 10,000 to 15,000 firms which engaged in some type of R&D in 1978, only 20 companies performed 50 percent of the work, according to the National Science Foundation. In that same year four firms were responsible for 20 percent of all R&D effort.

Investment in Venture Capital

Innovative vitality depends in part on financing for risktakers and entrepreneurs who want to start a new business or develop a new idea. In the early stages a company may obtain equity capital from individuals or venture capital companies. As the business' operation and scope expand, a firm generally turns to the public sale of stock to raise money.

How small firms fare in their efforts to secure financing in public stock offerings is one measure of the Nation's innovation climate. Trends during the 1970's showed a sharp drop in this indicator, followed by a slow recovery:

- In 1969, there were 698 offerings, raising $1.4 billion.
- In 1975, there were only four public offerings, obtaining $16 million. (Causes for this scarcity are explored later in this study.)
- In 1979, there were 73 offerings, securing $368 million.

Small, technology-based firms need venture capital more than other small businesses. Data on offerings by small technical companies during the years 1969 through the first six months of 1975 show the firms experienced significant problems in obtaining financing. There were 204 small technical companies which raised $349 million in successful public offerings in 1969. Four companies obtained $6 million in 1974 and *no businesses* in this category could gain financing through this method in the first six months of 1975.

In 1968 when venture capital was more readily obtainable, a company known as Integrated Electronics (Intel) secured $3 million and opened its doors. The company, a manufacturer of semiconductors, was started by two scientists who broke away from a large corporation to form their own business. In 1979, Intel had $663 million in sales and more than 14,000 employees. Its stock price has increased 10,000 percent since the company's founding. Intel invests heavily (more than 10 percent of its income) in research and development and continues to introduce new products.

In contrast, however, during the years when venture capital was sparse, another new company was not so successful in attracting financing in the United States and turned to foreign sources for needed funds. A 1973 case involved Silonics, Inc., a subsidiary which System Industries, Inc., of California, had formed to develop and market a new ink-jet printing process. Unable to raise the cash to put the new process into production, the parent company turned to foreign investors -- and opened the opportunity for the appropriation of American innovative ideas. A Tokyo-based company, Konishiroku Photo Industry Co., invested $5.5 million in Silonics -- in return for 49 percent of the new company. A business spokesman says the company now has one of the most promising imaging technologies of the 1980's -- but only 51 percent of the company is American owned.

Contributing to the scarcity of venture capital was the generally poor economic climate and the 49 percent maximum tax on capital gains which was in effect from 1969 to 1978 when the maximum tax was lowered to 28 percent. Prior to 1969, the ceiling had been 25 percent. Capital gains are those profits earned from the sale of stocks, bonds and other business investments and when the tax on such gains is higher, investment activity tends to be slower. After the reduction of the capital gains tax in 1978, purchases of public stock offered by small companies increased significantly.

The availability of venture capital for small firms is important to the overall economy because these companies have the highest rate of employment growth and have compiled an impressive record of innovation in the private sector. Firms with less than 1,000 employees accounted for almost half the major innovations between 1953-73, according to one study. Too, highly innovative firms respond to challenges of major technological or market changes -- a difficult adjustment for firms producing standardized products in large quantities.

Investment in Plant and Equipment

Investment in new factories and machinery provides an avenue to practical application of research and innovation because this kind of investment -- capital formation -- permits the introduction of new products and the implementation of new processes. Such investment is necessary to move innovation from the laboratory to the marketplace and can lead to productivity improvements and a stronger position in international markets.

Obsolete plant and equipment are rarely conducive to innovation. In most industries, new machinery is needed to utilize the latest technology, yet the estimated average age of industrial equipment in the United States is now over 20 years, compared to an age of 10 to 14 years for industrial equipment of U.S. competitors such as Japan and Germany, according to the American Productivity Center. In America, the equipment of some major, mature industries is 50 or more years old.

The difference in equipment age between the United States and other countries reflects a lower share of GNP going toward investment in the United States over the last decade. America has been spending less than both Japan and Germany to build new plants and outfit them with cost-cutting equipment. During the 1970's, the United States spent an average of 10.2 percent of GNP on plant and equipment, compared to an average of 16.9 percent of GNP in Japan and an average of 12.6 percent of GNP in Germany. Investment in new factories and machinery reached a high of 10.8 percent of GNP in the United States in 1979, a peak of 21 percent in Japan in 1979, and 14.7 percent in Germany in 1971. (See Table I (B), on Page 8.)

Expenditures in the plant and equipment category are directed toward several goals including replacement of existing equipment, pollution control, utilization of less energy and installation of additional machinery to achieve more production. When looking at plant and equipment investment figures, it is misleading to consider that all of the investment goes for expansion of productive capacity; however, it is this *net* investment which aids in growth of the economic base and results in higher standards of living. When plant and equipment funds are used for such objectives as pollution control and conversion of machines to use less energy, the amount which could be invested for additional physical capacity is reduced. In 1979, roughly one-fourth of the 11 percent of GNP directed to plant and equipment investment in the United States was spent for *additional* facilities and machinery because most of the funds were used to replace aging equipment. In the mid-1970's while plant and equipment investment was in the range of 10 percent of GNP, only about one-seventh of that investment was for *additional* structures and machinery.

The economic climate is one factor which helps determine investment levels. Although corporate managers may share in the blame for the short-term philosophy which has reduced long-term investment, it is also true that high inflation rates are detrimental to all kinds of investment -- including plant and equipment -- because inflation increases the rates of return which business must receive to keep abreast of rising costs. During periods of inflation, too, people tend to save less of their disposable income and since savings contribute to the pool of funds available for investment, this lack of savings is partly responsible for a lower rate of investment. The personal savings ratio for the United States has declined steadily since 1973 when Americans saved 7.8 percent of their disposable personal income. Americans in 1978 saved 4.9 percent of their income -- about one-fourth of the 20.1 percent savings in Japan and one-third of Germany's 13.8 percent (See Table I (D), on Page 8.)*

Because Japan saves one-fifth of its income and devotes a greater share of GNP to investment, that country has been able to accumulate capital rapidly -- reducing the differences in capital stock between the United States and Japan. (Capital stock of a country is defined as plants already erected and equipment in place.) Notable changes occurred in the capital stock of the United States relative to the capital of Japan during the period 1962-75, according to a Department of Labor study. In 1962, the United States had six times as much capital as Japan but by 1975 the comparison was altered markedly -- the United States had only twice as much capital as Japan.

Japan's greater rate of investment relative to the United States is one factor in that country's increased productivity and improved international position. From 1963-1975, while Japan was increasing its capital relative to the United States, it was also experiencing productivity growth several times greater than the United States and quadrupling its share of the world market for technology-intensive exports. In contrast, the United States' share of the world market for high technology goods declined by about one-third during the same period.

While the investment rate for the United States remained at a depressed level (relative to Japan) during the 1970's, the U.S. labor force grew by 22.4 million. As a result, the U.S. economy became more labor-intensive as the number of workers and prospective workers expanded at a rate greater than new on-stream equipment and places of employment. This is noteworthy because employment growth which is linked with plant and business expansion is a sign of progress. However, growth in labor-intensity is a sign of decline, not vitality. U.S. net investment in plant and equipment grew 1.8

---

*A broader definition of saving would include personal savings, business savings in the form of retained earnings and allowances for government surplus or deficit.

percent per year for 1970-79, compared to labor force growth of 2.5 percent a year. During the previous decade, net investment was 7.4 percent a year while labor force growth was 1.7 percent a year. The expansion in labor-intensity from the 1960's to the 1970's is reflected in data which show productivity growth declined in the 1970's while labor-intensity increased as shown in Table IV.

TABLE IV
Comparisons of Growth Factors

(Annual Growth Rates)

	Net Investment, Plant And Equipment	Labor Force	Labor Productivity
1970's	1.8%	2.5%	1.4%
1960's	7.4%	1.7%	2.9%

Even in the area of professionals most closely associated with R&D expansion, there have been signs of decline in America. A sufficient supply of trained scientists and engineers is an essential factor in the caliber of research and innovation. Investment in people through education ensures maintenance of a pool of well-trained and creative engineers and scientists. American science draws much of its strength from its academic institutions.

The linking of research and education at the postgraduate level can influence both basic research findings and innovation activities. The funding level of basic research affects the output of research but it also contributes to the output of people -- scientists and engineers.

The United States has more scientists and engineers engaged in research and development work (in absolute numbers) than other countries, except the Soviet Union. However, the number of such personnel as a share of the total labor force is increasing in other countries relative to the United States.

The United States proportion of scientists and engineers in the labor force was at its highest in 1968 and declined through the early 1970's. The level has been increasing slightly in recent years, although the ratio has not returned to the 1968 peak. While the U.S. decrease was occurring, Germany, Japan and the Soviet Union increased substantially the proportion of scientists and engineers engaged in R&D. Using a ratio of one scientist/engineer to 10,000 in the labor force, during the 1965-77 period:

- The United States experienced a decrease from 64 to 58, although there was a peak of 67 in 1969.
- Japan increased its share from 25 to 50.

- Germany's share went from 23 to 41.
- The Soviet Union's share grew from 45 to 82.

Later figures were available for only the United States and Japan. They show increases in the ratio of scientists and engineers per 10,000 labor force for the United States to 59 in 1978 and 60 in 1979, while the share for Japan dropped in 1978 to 49.

The number of scientists and engineers employed in R&D in the United States grew along with the number of degrees awarded in science and engineering although the pace was not as rapid as labor force growth. Changes in the number of scientists and engineers engaged in U.S. R&D have been as follows:

- 495,000 in 1965.
- 574,000 in 1977.
- 659,000 in 1980.

These figures are in comparison to the following numbers in Japan:

- 119,000 in 1965.
- 273,000 in 1978.

And to these in Germany:

- 61,000 in 1965.
- 111,000 in 1977.

And to these in the Soviet Union:

- 552,000 in 1965.
- 1.1 million in 1977.

The growth in science and engineering personnel during the 1960's was accompanied by an increase in Federal funding for scientific investigations sponsored by Federal agencies and for graduate fellowships and traineeships. This resulted in a rise in the number of doctoral degrees awarded. By the mid-1970's, however, doctoral awards began to decline as did Federal fund increases. The National Science Foundation projects continued decreases in doctorates awarded -- particularly in physics, chemistry, mathematics and engineering -- over the next five years. There is currently a need for doctoral personnel in computer sciences, solid state physics and engineering, and the demand in these high technology areas is expected to continue. The decline in doctoral awards could mean a critical shortage of R&D performers, especially in the areas of chemicals, electrical and nonelectrical machinery and aerospace where the United States is still most competitive internationally.

In analyzing personnel and education needs for the future, another area which may experience employee shortages is the computer industry. If that industry keeps growing at its current rate, by 1990 it would need one million programmers. This projected need for programmers far exceeds the number the Nation will produce unless present trends change considerably. It is possible, however, that technology -- such as the development of standard computer programs which would sharply reduce the need for totally individualized programs which require more highly trained personnel -- may help to offset some of the anticipated personnel shortfall.

While shortages are expected in some areas for future recipients of doctoral degrees, an oversupply may occur in other fields. This is expected partly because fewer academic jobs will be available -- a consequence of the decreasing number of undergraduates and the low retirement rate of professors. It is feared the lack of infusion of young scientists into the academic faculties will mean a less vital academic community.

The decline in number of doctoral degrees awarded has been accompanied by a decrease in government financial support for graduate students. In 1968, the Federal Government was the major source of support for 40 percent of the graduate students compared to about 24 percent of the graduate students in 1979.

The education of tomorrow's engineers and scientists requires an investment in expensive, modern teaching laboratories with up-to-date instrumentation and equipment, for it is in university laboratories that innovators of the future gain practical experience in solving problems, finding solutions and making decisions.

Many schools, however, are having difficulties financing the costly facilities and instruments which are needed. The consequence is that students are being trained on obsolete equipment; some experiments cannot be performed in existing facilities which are equipped with tools from an earlier generation. At a leading West Coast school, the newest accelerator used for work in pure and applied nuclear physics was built in 1960. A study by 16 independent private engineering colleges places the cost of keeping their laboratories up-to-date at $1500 per bachelor degree granted.

The decline in Federal spending for academic research facilities is partly to blame for the growing obsolescence of academic research installations. Government support of such facilities dropped from $212 million in 1966 to $24 million in 1977 (in 1972 constant dollars). Federal funds to universities for purchasing laboratory equipment also declined, but not as greatly.

Although Federal support for research facilities increased to $36 million in real terms in 1978, funding declines have been registered since. The 1980 funding level was $23 million in constant dollars, less than the 1977 allocation; and the 1981 proposed budget contains a further decline to $19 million.

IV

THE ROLE OF SMALL AND LARGE COMPANIES

History is filled with examples of individuals and small businessmen whose inventive ideas have changed life in America and in the world. To the list of earlier inventions such as Eli Whitney's cotton gin, the Wright Brothers' airplane, Alexander Bell's telephone, Thomas Edison's light bulb and Gordon Gould's laser have been added more recent innovations of copying machines, computers and microprocessors.

Such companies as Xerox and Texas Instruments, major innovators in their fields, began as individual endeavors. Firms entering the marketplace for the first time -- trying to gain entry with a new product -- stimulate innovative competition. The electric typewriter was introduced by a newcomer to business -- not the maker of manual typewriters. In turn, today's word processor was not developed in the established electric typewriter business, but in a new venture. New firms, vying for a spot in the marketplace, introduced the radio, transistor radio, incandescent lamp and cable television, as well.

Like many other American industries, semiconductors entered their most creative phase when individuals left parent companies to launch their own businesses. Many firms in the Santa Clara region of California were started by individuals who had been associated with large companies. This area acquired the name of Silicon Valley because of a dominant product, the silicon chip -- a key component of the microelectronics industry. Another Silicon Valley firm, the Hewlett-Packard Company, had its beginnings in a one-car garage when William Hewlett and David Packard made an audio-oscillator, a device that generates signals of varying frequencies. Now the world's largest producer of electronic measuring devices and equipment, Hewlett-Packard Company employs over 42,000 people.

Increasingly, however, the independent inventor finds it harder to attract the necessary funds for production facilities and marketing. Although small businesses have been the traditional innovators in America, they and independent inventors often require the resources of large corporations to commercialize new products. In their own right, however, large companies have been responsible for many innovations. It was in the Bell Laboratories of American Telephone and Telegraph Company that the first transistor was developed. Made of germanium and destined to transform the electronics industry, the transistor was a cheaper, sturdier and more efficient replacement for the vacuum tube which had been used previously in most electrical products. Researchers at another large company, DuPont, worked several years before producing nylon, a synthetic fiber. In the history of this product, nylon, there was a large chemical company to underwrite the years of research necessary to create it. When it came time to break into the market, a pool of experience in marketing techniques was available. DuPont introduced nylon hosiery in May of 1940 -- and in the first year alone sold 64 million pairs. The development of nylon continues to have far-reaching benefits; for example, one of today's uses for nylon is for the interfacing material between heart pacemakers and human tissue.

In high technology industries, success often depends upon innovation. Large businesses today are working on scientific advances which will contribute to high technology areas of the future economy. General Electric Company has developed bacteria which can digest oil, and the patenting of that discovery is a landmark from which a myriad of similar findings could spring. GE scientists also are working on a sodium sulphur battery which will allow electric utilities to store excess power during periods of low demand for use during peak periods. Employees of International Business Machines are experimenting with computer controlled beams of electrons which etch the circuits onto tiny silicon chips -- striving for a more powerful, faster and cheaper microprocessor. Some large companies -- such as GE, McDonnell-Douglass and TRW -- are preparing for work in space because the National Aeronautics and Space Administration has leased facilities on a space shuttle to depart in 1981. Companies reportedly are waiting in line to have space on the shuttle because they want to produce ultrapure silicon crystals for microprocessors and rare enzymes, both products which are impossible or not economically feasible to produce on earth because of gravity.

Large companies -- among their other contributions to the economy -- sometimes are relied upon by the small innovator for production and marketing of the innovative products. Individuals or small businesses often conceive the idea which results in the original innovation, but the resources of large firms are needed for marketing and production. Diffusion -- the spread of the new product into the marketplace -- determines the success of the innovation, as illustrated by the history of the sewing machine.

Although the sewing machine was originally patented by Elias Howe, it was Isaac Singer's firm which manufactured and sold millions of them, creating the Singer name association with the sewing machine. The sewing machine case -- the coupling of Howe's original technological genius with Singer's production and promotional ability -- is illustrated in many inventions. The Singer firm flourished, but the company Howe had founded ultimately disappeared.

While the resources of large companies are significant to the innovative process, it is small companies -- usually with more internal flexibility, with a more narrow focus, perhaps on one product, and more willingness to gamble on the success of that product -- which are regarded as disproportionately important to the growth of the U.S. economy. According to a study by the National Science Foundation:

- Small firms (with less than 1,000 employees) were responsible for almost one-half of the most significant new industrial products and processes during the period 1953-73.
- Businesses with less than 100 employees contributed almost one-quarter of the innovations.
- Small firms produced four times as many innovations for each dollar invested in R&D as did medium-sized firms and 24 times as many innovations per R&D dollar as large firms employing more than 10,000 employees.

While it is true that most small businesses perform no R&D, small firms which do engage in R&D do so more efficiently than large companies.

Other evidence shows that, during the period 1966-76:

- Small firms increased their R&D investments at a more rapid rate than that of all firms combined.
- While all company-funded R&D grew at an average annual rate of 9.2 percent during the same period, company-funded R&D at small firms increased at an average annual rate of 10.6 percent.

The pattern was more pronounced in the years 1972-76 when the average annual rate of growth of industry-funded R&D at all firms was 10.8 percent, while that at firms with less than 1,000 employees was 15.2 percent.

The role of small business has been especially important in the less expensive, early stages of innovation, as well as in industries where innovation as a whole is less costly and within the financial ability of small firms. A 1977 report of the Office of Management and Budget concludes that while companies with fewer than 1,000 employees received only 8 percent of the Federal R&D dollar, those companies were responsible for about 50 percent of the major technical innovations over a 20-year period. Another study shows that a benefit from private investment in small innovative ventures, besides the creation of new jobs, is an additional $35 in tax revenue for each $100 of private capital invested in the business.

As noted, some reasons offered to explain the innovative success of small businesses are their flexibility and willingness to take risks -- characteristics often lacking in large, mature firms. One theory is that as an industry matures, it becomes more resistant to change and, thus, to new technology. In some industries substantial investment in production processes which have been standardized can work against major innovations. Such companies often feel that the financial commitments are too great and the organizational structure of the business too established to successfully undergo change.

While the introduction of new, first-time-on-the-market products frequently attracts much of the public attention, development of new processes to make the products are important to economic growth because new processes enable American workers to produce more. For example, the advent of the computer and photo-typesetting composition techniques has resulted in the newspapers of America being able to provide more and later-breaking news for its readers. Only a few years ago typesetting machines which cast words and stories into metal at the rate of 15 lines per minute were used. Those hot metal machines were replaced by new technology phototype equipment which produces 2,500 lines per minute. Broadcast journalism has benefitted from technology gains by its use of small, portable cameras which bring stories to the screen live from locations away from the studio.

In addition to major innovations, a series of minor innovations can culminate in economic benefits. Regular, consecutive gains in petroleum refining processes have amassed into significant productivity growth. Incremental innovations, such as the use of larger railroad cars and unit trains, have resulted in dramatic reductions in the cost of moving large quantities of materials by rail. Because of continuing incremental improvements of incandescent light bulbs, the price of those bulbs has fallen more than 80 percent since their introduction. Similarly, because of incremental improvements of the DC-3, airline operating costs have been slashed by half. Semiconductor prices have a pattern of falling 20 to 30 percent each time production is doubled. In the examples from oil refining to semiconductors, major process innovations have been followed by numerous minor improvements both to products and processes.

V

FACTORS AFFECTING INNOVATION

Regulations

Innovation, in the form of more efficient equipment and less polluting processes, has helped American businesses conform to a variety of regulations, but those same regulations often have restrained innovation and diverted funds from productive innovation investment.

The joining of innovation and regulation has had both positive and negative effects as private businesses strived for public goals of a cleaner environment, safer workplaces, and less hazardous consumer products. These are goals whose attainment benefits society, but the results are not registered in the measurements which track U.S. economic performance and growth.

There have been times when the combination of regulation and innovation has resulted in positive developments for both social and economic aims. Many regulators argue that regulation has led to cost-saving practices, especially in the area of resource recovery. In a process where water is used, for example, that resource (water) can be retained in a closed cycle process and after purification can be used again -- instead of dumping the used water in open processes.

One company has introduced a lithograph printing plate that uses non-polluting tap water, instead of chemical developers, to produce an image. It has also been suggested that regulations spurred American car makers toward fuel efficiency goals. The other side of the regulation-innovation issue is that money which is spent complying with regulation depletes the funds available for research and development -- the birthplace of most innovation -- and decreases the investment in plant and equipment, the means of moving an invention from the infant stage to the market. Too, the unpredictability of future regulations has inhibited development of new products and new processes as much as current regulations. Innovation itself involves a considerable amount of risk; and, when combined with the uncertainty of regulation, this risk is compounded.

From the evidence available, compliance costs placed on the economy already amount to more than $100 billion a year. In 1965, $93 billion worth of goods and services were produced under varying degrees of regulation. By 1979, the total was $358 billion -- nearly four times more than in 1965. The influence of government regulation on the economy is significant. Because it affects both the demand for and the supply of goods and services, regulation has an important impact on what is produced, how it is produced and for whom it is produced.

The role of regulation and its impact on innovative investment is particularly important in the context of small business. Small businesses create 66 percent of all new jobs and generate 24 times as many innovations per research dollar as do the largest companies. By any standard, small business is important to the innovative process and a catalyst to economic growth. As such, it should be nurtured rather than encumbered.

Unlike larger companies, small concerns do not enjoy the luxuries of separate accounting, finance and other divisions which can share the burdens of regulatory compliance. It comes as no surprise, therefore, that government regulation may actually be inhibiting the formation of new business enterprises. *

Patents

Established in 1789 by the U.S. Constitution as the final governmental incentive for research, patents represent one concrete result of research and development. While patent activity is used as one measure of innovative activity, analysts caution that patents are only a rough indication of inventive vitality.

Patent activity by U.S. inventors declined during the 1970's both at home and abroad. The decline occurred in almost all product fields. In contrast, patenting in the United States by foreign nations, particularly Japan and Germany, increased during the same period.

Patenting is affected by a number of factors, including the decision to use a patent or trade secret to protect discoveries. In addition, R&D expenditures, economic or market interests, patent laws and regulation are other determinants in patent filings. From 1971-78, the number of patents granted annually to U.S. inventors declined by about 26 percent. Some reasons offered to explain the decrease are:

---

* A more detailed discussion of regulation, and of the associated policy recommendations is provided in the SSEC paper entitled "Government Regulation: Achieving Social and Economic Balance".

- Lower profit margins and economic uncertainty have made it unattractive to expand product lines through new inventions.
- Industry has a large commitment in plant and equipment to existing products and processes and is not looking for ways to change them.
- Inventions may not be needed as much as they once were because many inventions made in the 1960's remain to be exploited commercially before new ones are needed.

The patent system itself is blamed for some of the decline in patenting. For small businesses and industries where technology is changing at a rapid pace, obtaining a patent may prove too expensive and time consuming. Some companies do not pursue the patent process because of the increasing number of court challenges to patent validity and the potential expense of a lawsuit. There is criticism, too, of the administration of the patent system, particularly of the length of time taken to process a patent application and the lack of depth of investigations about previous patents on similar discoveries.

Some industries prefer patents for protection while some industries turn to trade secrets. While patent protection is limited to 17 years, trade secret protection lasts as long as secrecy is maintained. Innovators in some fields, such as electronics, contend that technology is changing so quickly that an innovation could be replaced by the time the patent is granted, and, therefore, these inventors prefer to rely on trade secret protection. Trade secrets can be a means of gaining exclusive use and economic benefits from an invention without disclosing technology. The tendency to rely on the patent system is highest in industries where technical advances are easily copied with little independent development work. Secrecy may be more desirable than patenting if the costs of detecting and policing patent infringement are high, as in the case of some process inventions.

Foreign country patenting by U.S. inventors decreased by almost 18 percent from 1967-77. The factors which influenced patenting in the United States also prevailed in foreign patenting. In addition, some foreign laws are considered too strict and the apparent benefits of holding patents in some foreign countries are not large enough because of limited product markets. Also, national credit for patents may be shifting somewhat because in many cases subsidiaries of U.S. corporations abroad assume the nationality of the host country when patenting inventions, and, therefore, inventions are not attributed to U.S. ingenuity.

While U.S. patenting dropped, foreign patent activity in the United States was on the rise:

- There was approximately an 11 percent increase in patents granted to foreign citizens between 1971-78, compared to a 26 percent decrease in U.S. patents granted to U.S. citizens.
- Foreign inventors obtained 38 percent of the U.S. patents in 1978, up from 20 percent in 1966.

Many of these foreign patents, of course, are assigned to U.S. companies or individuals and are available for use by their U.S. owners. For example, although 35 percent of all U.S. patents in the communications equipment product field from 1975-77 were granted to foreign inventors, more than 15 percent of these foreign inventions were owned by U.S. companies or individuals.

The large, lucrative market of the United States is economically inviting to foreign competitors and the increased patenting activity by foreign countries in the United States has been accompanied by an expansion of exports to the United States and more R&D expenditures in their home nations. Taken alone, the rise in patents for foreign inventors might not be notable, but when improved export performance of America's economic competitors -- especially Japan and Germany -- is considered, the foreign patent activity is relevant as are increased R&D expenditures by those countries.

VI

POLICY IMPLICATIONS AND RECOMMENDATIONS

America's preeminent economic success is rooted in many decades of technological advance. Innovation and technological progress have formed the basis for a sustained rate of economic growth -- providing a continually improved standard of living which Americans have come to view as a heritage to be transmitted by each generation.

The changes which have been induced by innovation -- such as electricity, modern agriculture, communications and transportation -- have been fused into the fabric of society, profoundly altering the way of life. Advances in science and tecnhology have the potential to meet many of the challenges the United States and the world will face during the next two decades. With world population predicted to grow by about 40 percent by 2000, technological advances will be needed even to maintain the present standard of living around the globe. Research and innovation will be called upon to meet more peoples' needs for food, energy, housing, health care, learning, transportation and other facets of living. Without a strong technological foundation, these needs will not be satisfied. Science and technology alone are not sufficient, but they are necessary . . . along with measures and policies to meet the social goals of society.

Scientific research, if vigorously pursued, can guide a more effective application of natural and human resources. A high innovation rate is desirable to structure technology, for example, to produce more and higher quality food, to conserve present energy supplies and find alternatives. Technology can help find alternatives for materials now in short supply. It can lead to the acquisition of raw materials and a cleaner, safer manufacturing process. Technology advances are linked to productivity improvements and a better international position. Innovation helps create jobs as well as stabilize and even lower prices.

Innovation includes experimental applications and ends with commercialization to meet the needs of the marketplace. It is the industrial environment that is most conducive to promoting a discovery or invention to the status of innovation. For most of two centuries in the United States, industry in the free enterprise system has been extremely successful in matching the needs of citizens with the capability of technology.

Many of the challenges of the future, however, call for a more cooperative approach to innovation by industry, government and universities. This three-pronged support of technological advancement is necessary because of the acknowledged complexities of future innovation and because of past and current economic conditions. As the United States enters the last score of the 20th century, it carries with it the scars of the 1970's: Severe price inflation spurred by dramatic increases in energy prices, aggressive international competition, declining productivity, rising unemployment, and sluggish investment in research and development and in plant and equipment. It is argued that general economic conditions provide the main drag on the innovative efforts of U.S. industry, not the lack of creative, inventive talent and ideas. Poor economic performance depresses profits from which industry can reinvest in technological developments.

Even when economic conditions are favorable, an increasing share of promising technological projects call for investment beyond the financial level of most corporations. The costs of certain facilities needed by both industry and academic scientists have escalated beyond the means of either. Many potentially beneficial programs -- such as the development of ocean resources, nuclear fusion and space systems -- require both government-industry cooperation and international cooperation. One such effort already underway is the space shuttle set for launching in April, 1981, when industry and government plan to conduct laboratory experiments in space. Involvement of industry, government and universities in joint projects helps assure that the technology acquired in the ventures is spread through society. Government officials involved in the space shuttle project today recognize the full potential for public benefits will be realized if space travel spinoffs are not only developed but also ultimately utilized by the industrial community. Through such joint efforts, the transfer of technology to society will occur more rapidly.

Congress has taken a significant step toward encouraging a more cooperative atmosphere through the passage of legislation to establish industry technology research centers. These centers are patterned after experimental facilities already underway. Envisioned is a network which brings a cohesiveness to the fragmented elements of society already involved in research and innovation. The centers are viewed as the best hope of bringing to the economy the positive contributions of:

- The academic-university environment where basic research flourishes.
- The industrial sector where ability and techniques exist to convert an inventive idea into an innovation.
- The Federal Government with its capacity to foster a climate which values long-term investments in and commitment to research and development.

The centers will be designed to use funds and personnel from each segment and with a goal to reduce Federal funding as centers become self-sufficient. Such centers would:

- Concentrate on underlying technology important to a variety of industries.
- Disseminate foreign and domestic technical information.
- Serve as an educational and training facility for students. In the future, consideration could be given to establishment of intern programs.
- Provide technical assistance and advisory services, an aid of particular importance to small and medium size firms.

Through fertile understanding, academia and government can grasp the marketplace pressures which face business, while industry can appreciate better the language of the basic research in the academic world. The education process of universities could be enhanced through faculty resources based in industry, and the exchange of people could be a catalyst to the flow of information among government, university and industry.

At the same time that these three components engage in cooperative programs, steps must be taken to increase public understanding and participation in scientific and technological activities. It takes an informed citizenry to understand and adapt successfully to technological advances.

While a cooperative endeavor is one means of cultivating research and innovation, more comprehensive investment in research and development, plant and equipment, and human resources will be necessary to ensure future economic vitality. If innovation is to be an effective tool, the United States perspective will have to shift to a long-term, anticipatory framework, rather than a short-term, reactive one. At the same time, this requires an economic environment -- mostly fostered by the Federal Government's policies -- which encourages longer-term, private business decisions. Additionally, the shift in thinking would entail change for both American businesses and citizens because many businesses tend to base their investments on decisions which will result in short-term profits, rather than in future, long-term payoffs, and because Americans tend to save a lesser portion of their disposable income than people in competitor nations. The short-range investment view of business and the lower personal savings rate erodes long-term national commitment to innovation.

While investment is a key element in promoting innovation, government policies should be reviewed to ensure they do not act as barriers to the development of innovative firms. Areas for review, addressed in other staff studies of the Special Study on Economic Change, include:

Regulatory policies which may divert funds needlessly from R&D investment. The goal should be to achieve compliance without compromising social goals but at the same time do so efficiently, in the least costly manner, and with as little waste as possible. Regulations have a marked impact on small businesses, and because of the significant role of small businesses in both innovation and employment, the burdens of regulation should be eased, where possible.

International trade policies which could affect industry's role in the international market. International trade is particularly important because exports of U.S. high-technology industries help balance the imports which the country needs. Various government programs affecting international trade should be studied, and, if necessary, be revised to avoid undue interference with the sale of U.S. products abroad. International trade policies should place more emphasis on exports and strive to make American products more competitive in foreign markets. Negotiations on trade problems and adjustment assistance should be geared to assure United States companies access to markets abroad and adjustment benefits at home, where possible.

In order to stimulate the growth that is necessary to realize the full potential of the United States' increasing labor force and to compete more effectively in international markets, a three-tiered investment strategy is needed. Incentives could encourage investment in research and development, in more modern plant and equipment, and in human resources.

Investment In Research and Development

Government policy on research and development is of major importance because the U.S. Government provides about half the funds for all R&D in this country and because government tax, patent, antitrust, trade, Federal procurement and regulatory policies influence privately financed R&D. Technological innovation is inherently a private sector activity, but government affects innovation in major ways. These measures could help ensure an adequate level of R&D activity:

- Basic research funding levels which take account of inflation and the increasing complexity of conducting such research. Funding growth needs to exceed the rate of inflation because it is in basic research that the knowledge base for future innovation is discovered. Basic research is becoming more complex as sources of major technological advances now require a deeper exploration of scientific principles with specialized facilities, larger research teams, and expensive instruments and equipment.
- Continued strong Federal support for academic research. Funding increases in real terms for a number of years will be necessary to compensate for substantial declines in this funding between 1968 and 1976 and for the soaring costs facing universities.
- Federal assistance to universities to modernize their facilities for basic scientific research. A protracted period of low investment for research plant and equipment for universities has caused many installations to become obsolete and inadequate for current research projects. Several years of increased funding will be necessary to update the facilities and equipment for future research needs.

Although industry more than doubled the dollars invested in research and development during the 1970's, inflation significantly mitigated the contribution. Even with the growth in funding, however, private industry in the United States contributes less relative to GNP than private business in Japan and Germany. To encourage research and development activities by industry, revisions in the tax code are recommended. Revisions could include:

- Expansion of the tax provisions to provide an investment credit for R&D business expenditures in addition to the current allowable deductions and to permit credit for investment in R&D structure and equipment along with depreciation of such facilities and equipment as presently allowed. More favorable treatment could be given to firms which *increase* their levels of R&D spending, with special emphasis on the early years of high-technology firms.
- Enactment of tax credits for contributions made by individuals and corporations to nonprofit research-oriented activities.
- Provision of a tax exemption on capital gains from the sale of venture capital stock if the capital gains are reinvested in new small, R&D-oriented businesses within a specified time period.

- Increases in the amount of losses within a specified time frame which can be deducted from ordinary income by an individual who invests in a new, high-technology company. Small technology-based firms which are considered risky ventures could be assisted in attracting investors.

Investment in Plant and Equipment

Plant and equipment investment is essential for the transformation of research ideas into new products and processes. New facilities and machinery are needed to utilize the latest technology and to move innovation from the laboratory to the marketplace. Because this kind of investment lagged during the 1970's, incentives are needed to encourage plant and equipment investment. Possible incentives include:

- Provisions which encourage personal savings. Such provisions could exclude a greater amount of interest income from taxation and decrease the tax rate on capital gains. Personal savings are important because they contribute to the pool of finances from which plant and equipment investment must come.
- Liberalization of the tax code depreciation provisions to allow faster depreciation of non-residential investments. Depreciation allowances are tax write-offs designed to compensate businesses for the decline in the value of aging equipment. Allowances for the depreciation of existing plant and equipment are based on original purchase price which in a period of rapid inflation is much lower than the replacement cost. As a result, the real value of the tax write-off is reduced, and businesses pay higher taxes. This has the effect of diverting into taxes the dollars which might have been available for reinvestment.

Investment in Human Resources

America's labor force needs the skills and education to conduct research and development and to operate modern machinery. Investment in the education and training of United States workers should accompany the investment in R&D and in plant and equipment in order to accommodate technological improvements. Measures to assure an adequately educated and skilled labor force include:

- Internship programs under the industrial technology research centers described earlier in this policy section. In return for Federal educational financial aid, interns could be required to work a prescribed period of time at such a research center -- contributing both to the education of the intern and the research output of the center.

- Increases in the share of student financial assistance programs devoted to studies for the advancement of science and technology. Such programs could be targeted for study of specific areas under agencies like the National Science Foundation. Greater assistance should be directed toward academic areas in which future personnel shortages are anticipated.
- Programs to provide retraining and reemployment in adjustment assistance for workers displaced because of technological change. The emphasis should be to direct workers to growth areas rather than exclusively on supplementary unemployment insurance. This is not to suggest that policy directed at retraining and reemployment in growth sectors is the only course, but that policy should concentrate on and emphasize the merits of a national goal to best utilize resources in the growth sectors and to improve national productivity performance.

Contents of Volume

The following outline contains a list of titles and authors of papers which will appear in the final printed volumes of the Research and Innovation section:

Introduction (Walter A. Hahn, CRS)

Section 1 -- What is known?

1. Two Decades of Research and Innovation: Selected Studies of Current Relevance (Richard Kremer and Mary Ellen Mogee, Congressional Research Service)

2. The Process of Technical Innovation in Industry: A State-of-Knowledge Review for Congress (Mary Ellen Mogee, Congressional Research Service)

3. The Relationship of Federal Support of Basic Research in Universities to Industrial Innovation and Productivity (Mary Ellen Mogee, Congressional Research Service)

4. The Domestic Policy Review of Industrial Innovation: Public Inputs, Outputs, and Implications for the Congress (Mary Ellen Mogee, CRS; William Boesman, CRS; Louise G. Becker, CRS; Jane Bortnick, CRS; Wendy H. Schacht, CRS; Joseph P. Biniek, CRS; John E. Blodgett, CRS; Thomas D. Gallagher, CRS; Dennis M. Roth, CRS; Janice E. Rubin, CRS and Walter A. Hahn, CRS)

Section 2 -- Status

1. Research, Innovation, and Economic Change: Policy Options for Congressional Consideration (John M. Logsdon, George Washington University)

2. Technical Advance and Economic Growth: Present Problems and Policy Issues (Richard R. Nelson, Yale University)

3. The Revival of Enterprise (Theodore J. Gordon, The Futures Group)

Section 3 -- Explorations

1. The Role of Imbedded Technology in the Industrial Innovation Process (Albert H. Rubenstein, Northwestern University)

2. A Quantitative Technology Index to Aid in Forming National Technology Policy (George Foster, Marvin J. Cetron and Audrey Clayton, Forecasting International, Ltd.)

3. The Role of Small-Scale Technology in Innovation (Wendy H. Schacht, Congressional Research Service)

4. Innovation in Public Technology (Wendy H. Schacht, Congressional Research Service)

Section 4 -- Outlook

1. Science and Technology Outlook Related to Economic Change (William Boesman, Congressional Research Service)

Appendix

Authors of Selections

WALTER A. HAHN, *Congressional Research Service*
RICHARD KREMER, *Congressional Research Service*
MARY ELLEN MOGEE, *Congressional Research Service*
LOUISE G. BECKER, *Congressional Research Service*
JANE BORTNICK, *Congressional Research Service*
JOSEPH P. BINIEK, *Congressional Research Service*
JOHN E. BLODGETT, *Congressional Research Service*
THOMAS D. GALLAGHER, *Congressional Research Service*
DENNIS M. ROTH, *Congressional Research Service*
JANICE E. RUBIN, *Congressional Research Service*
JOHN M. LOGSDON, *George Washington University*
RICHARD R. NELSON, *Yale University*
THEODORE J. GORDON, *The Futures Group*
ALBERT H. RUBENSTEIN, *Northwestern University*
GEORGE FOSTER, *Forecasting International, Ltd.*
MARVIN J. CETRON, *Forecasting International, Ltd.*
AUDREY CLAYTON, *Forecasting International, Ltd.*
WENDY H. SCHACHT, *Congressional Research Service*
WILLIAM C. BOESMAN, *Congressional Research Service*

Participants on Hearing Panels

(Listed in order of their appearance)

WALT ROSTOW, *The University of Texas*
F. THOMAS JUSTER, *The University of Michigan*
PAUL McCRACKEN, *The University of Michigan*
RUDOLPH PENNER, *American Enterprise Institute*
GEORGE BREAK, *The University of California, Berkeley*
DON J. SUMMA, *Arthur Young and Company*

Volumes of the Special Study on Economic Change

Human Resources and Demographics
Energy and Materials
Research and Innovation
Stagflation
Government Regulation
Federal Finance
State and Local Government
Social Security and Pensions
The International Economy
Productivity

The Research and Innovation section of the Special Study on Economic Change, Joint Economic Committee, is one of 10 sections of the SSEC. Orders for this study may be placed by contacting:

Joint Economic Committee
Room G-133
Dirksen Senate Office Building
Washington, D.C. 20510
Telephone: (202) 224-5321

Stagflation:

The Causes, Effects and Solutions

Joint Economic Committee

Special Study on Economic Change

A staff study

December 1980

(149)

The Joint Economic Committee's Special Study on Economic Change (SSEC) was inaugurated under the leadership of then Chairman Richard Bolling (D.-Mo.) and Vice Chairman Hubert H. Humphrey (D.-Minn.), together with Senator Jacob K. Javits (R.-N.Y.), ranking Minority Member.

The study progressed through Mr. Bolling's chairmanship and into the leadership of Senator Lloyd Bentsen (D.-Tex.), chairman; and Congressman Clarence J. Brown (R.-Oh.), ranking Minority Member. The goal of the SSEC is to chart the major changes in the economy and to analyze their implications for policymakers.

JOINT ECONOMIC COMMITTEE

LLOYD BENTSEN, Texas, *Chairman*
RICHARD BOLLING, Missouri, *Vice Chairman*

SENATE

WILLIAM PROXMIRE, *Wisconsin*
ABRAHAM RIBICOFF, *Connecticut*
EDWARD M. KENNEDY, *Massachusetts*
GEORGE McGOVERN, *South Dakota*
PAUL S. SARBANES, *Maryland*
JACOB K. JAVITS, *New York*
WILLIAM V. ROTH, Jr., *Delaware*
JAMES A. McCLURE, *Idaho*
ROGER W. JEPSEN, *Iowa*

HOUSE OF REPRESENTATIVES

HENRY S. REUSS, *Wisconsin*
WILLIAM S. MOORHEAD, *Pennsylvania*
LEE H. HAMILTON, *Indiana*
GILLIS W. LONG, *Louisiana*
PARREN J. MITCHELL, *Maryland*
CLARENCE J. BROWN, *Ohio*
MARGARET M. HECKLER, *Massachusetts*
JOHN H. ROUSSELOT, *California*
CHALMERS P. WYLIE, *Ohio*

JOHN M. ALBERTINE, *Executive Director*
LOUIS C. KRAUTHOFF II, *Assistant Director-Director, SSEC*
RICHARD F. KAUFMAN, *Assistant Director-General Counsel*
CHARLES H. BRADFORD, *Minority Counsel*

Table of Contents

CHAIRMAN'S INTRODUCTION i
Senator Lloyd Bentsen

RANKING MINORITY MEMBER'S INTRODUCTION iii
Rep. Clarence J. Brown

INTRODUCTION 1

THE COST OF FIGHTING INFLATION 3

WHAT IS TO BE DONE? 8

ONE VIEW OF THE PROCESS 16

PRODUCTIVITY 24

APPENDIX

Contents of Volume
Index Narrative
Author's Biographical Data

CHAIRMAN'S INTRODUCTION

Senator Lloyd Bentsen

Chairman, Joint Economic Committee

No single word better describes the economic difficulties of the past decade than *stagflation* -- that unfortunate combination of inflation (or rising prices) and stagnation (or sluggish economic growth).

Stagflation did not emerge as a grave threat to the industrialized nations of the world until the 1970's. Before the past decade, an apparent trade-off existed between inflation and stagnation, with one normally easing as the other increased. But the situation has changed dramatically. Instead of one evil serving as an antidote for the other, both of them are occurring at once.

The 1979 experience provides a good example. Inflation that year continued to soar at an annual rate of 9 percent, despite a drop in economic growth to just 1 percent. Traditional economic policies suddenly appeared ineffective, since their solution for one problem only made the other worse.

The following staff study from the Special Study on Economic Change takes an in-depth look at the stagflation dilemma, emphasizing the basic changes in the economy that have helped bring about stagflation. In particular, the study analyzes those factors that have fueled inflation and caused it to persist during periods of stagnation. The study pinpoints a number of Federal Government activities that appear to contribute to the problem.

Inflation -- and inflationary expectations -- have become deeply rooted in the American economy. Cost-of-living escalators, business contracts, government programs, environmental and safety regulations all have helped to create a built-in, or "core", rate of inflation that remains high even as business becomes sluggish.

This study reminds that the economy has been buffeted by certain outside events, called "external shocks", that have raised the general level of inflation. Our increasing ties to the world economy have made us much more vulnerable to the actions of other countries. The shock of the four-fold increase in world oil prices during the 1970's offers the most vivid example.

But most of the factors that lie behind stagflation are internal, forming part of the very fabric of our economy. To the frustration of those who have supported the use of old treatments for new problems, these factors continue to resist the conventional prescriptions.

The stakes involved are high. This study points out that stagflation is indicative of progressively worsening performances in our economy.

As is apparent by now, the answer to stagflation will have to come on two fronts. Needed are policies that simultaneously reduce inflation and stimulate economic growth. Since stagflation has many causes, it will demand a variety of solutions, applied patiently and with a firm resolve. Whatever else the experience of the 1970's may have taught us, it is clear that there is no easy, short-term cure.

This staff study and the accompanying technical papers which form Volume IV of the SSEC contribute significantly to the decision-making process in government. The study examines hopes for economic revival, reaching the conclusion that fighting inflation with rising unemployment is unacceptable and unnecessary. The study determines that, for too long, too much emphasis has been on managing demand and not enough on improving supply. It concludes that a greater commitment to increasing supply will improve the long-run growth potential of the economy and of productivity. And, over an extended period, there will be a major payoff on the inflation front, as well.

Ranking Minority Member's Introduction
CONGRESSMAN CLARENCE J. BROWN

Stagflation has gripped this country for most of the past decade. The past four years have shown just how serious this affliction is in our country.

	Real GNP Growth (72 dollars)	Inflation (CPI)
1977	5.5	6.8
1978	4.8	9.0
1979	3.2	13.3
1980	- .2	12.4

While the inflation, the interest rates, the unemployment, the slow growth and the uncertainty are extremely troublesome for all Americans, what is particularly worrisome is the large number of public officials who have not learned one thing from one decade of economic disgrace. There are those who still want government and government's programs to save our economy. Never has a hope been so misplaced.

The mere presence of stagflation questions the efficacy of the oldtime economics. These worn out economic theories told us that economic growth could lead to inflation, and, consequently, that slow economic growth would *make* inflation low. If that is true, how can we have economic growth slumping and inflation rising? How could we be in this predicament for almost a decade? We have been waiting during this decade for the oldtimers to successfully answer this question. The simple fact of the matter is that they cannot. And a simple truth of the matter is that the oldtime economics have caused our economic problems.

This bankrupt economic doctrine that has guided our Nation's economic policy for the past 50 years has tried to fight unemployment and inflation alternately. To fight unemployment, monetary and fiscal policy were placed on *Go.* As inflation eventually grew as a result of this over-stimulative policy, both monetary and fiscal policy were placed on *Stop*. As unemployment grew, policy was switched to *Go* again. The result was an economy constantly thrown between boom and bust. However, the real problem for the economy, and the real basis for stagflation, is that each attempt to slow inflation or unemployment was increasingly less able to do so. The result has been a steady increase in the lowest inflation rate and lowest unemployment rate that can be achieved during successive business cycles.

The way out of our present stagflation economy is to follow the program that was first laid out in the Republican sections of the 1977 Annual Report of the Joint Economic Committee. We must allow our economic policy tools -- monetary and fiscal policy -- to each address the economic problem that they can fight best. To fight stagnation, we must have a fiscal policy aimed at economic growth; that is, marginal tax rate cuts for individuals and business, depreciation reform and regulatory reductions. To fight inflation, we must gradually reduce the rate of growth in the money supply. Only through this two-tier policy can we address the problems of slow growth and inflation *at the same time*.

Soon Congress will have before it the new President's economic package, which, in essence, will be what the Joint Economic Committee Republicans have been preaching for over four years. Congress must move quickly on the economic package in order to tell the American people that the oldtime economics are out; it will not be business as usual. If Congress acts expeditiously, then growth and opportunity, and not stagflation, will be our legacy.

Volumes of the Special Study on Economic Change

Human Resources and Demographics
Energy and Materials
Research and Innovation
Stagflation
Government Regulation
Federal Finance
State and Local Government
Social Security and Pensions
The International Economy
Productivity

Special Study on Economic Change

Louis C. Krauthoff II, ***Director***
George D. Krumbhaar, Jr., ***General Counsel***
Bill R. Maddox, ***Editor***

STAGFLATION:

The Causes, Effects and Solutions

Staff study prepared under the direction of:

Edwin Dale
Economist
Economic Stabilization Subcommittee of the
Banking, Finance and Urban Affairs Committee

Steve Entin
Economist, JEC

Associate Contributor:

George D. Krumbhaar, Jr.
General Counsel, SSEC

Technical studies prepared under the direction of:

Richard D. Bartel
Economist, SSEC

William R. Bryan
Chairman, Department of Finance
University of Illinois

STAGFLATION

The Causes, Effects and Solutions

I

INTRODUCTION

Stagflation is a new phenomenon in the history of advanced industrial economies, which emerged in pronounced fashion in the decade of the 1970's. Government policymakers and the economics profession have been struggling to understand and control this problem. It is now apparent that a fresh look must be taken at traditional economic policies, and that policy tools will have to be employed in a more flexible and sophisticated manner if stagflation is to be eliminated.

This study describes two major views of the stagflation dilemma. These views, while not identical, are not opposite or incompatible. Together, they lead to similar policy recommendations; those differences in policy that do exist are mostly differences of emphasis rather than substance.

In addition, other areas of the Special Study on Economic Change treat individual aspects of stagflation. The Government Regulation study comes to conclusions which are mentioned in this study. Other reports on Federal Finance, Research and Innovation, and Productivity contain issues which are part of any complete examination of stagflation. This means that some of the issues which are described in this study are given more extensive treatment in other parts of the SSEC. Moreover, the complexity of, and varied views on, the subject merits the seven page Index Narrative appearing at the end of this study. The Index Narrative summarizes views of technical papers to appear in Volume IV of the SSEC.

Stagflation is defined as a condition of significant inflation (rising prices) combined with stagnation (sluggish or even negative growth of real output). This stagflation has produced a relatively high rate of unemployment, compared to the post-1945 norm, though not the mass unemployment and hardship associated with past periods of crisis.

In the United States, the "flation" part of stagflation was present throughout the past decade and was much worse at the end than at the beginning. The "stag" part was more intermittent, there having been some years of good growth and high employment. As the decade ended, the year 1979 was a quintessential example of stagflation -- inflation of about 9 percent and growth during the year of only about 1 percent. Most years of the 1970's had shown better results, a few just as bad as 1979. In general, the disease seemed to be getting no better and probably was getting worse.

The new element in modern inflation is its *persistence* and its tendency to "ratchet" upward over time, rather than its *existence*. Inflation has been a recurring experience throughout economic history, and it has been associated with surges in monetary growth not matched by growth in total supply. But in the past, inflation eventually subsided. Now inflation drops back a little during downturns of the business cycle, but each upswing of the cycle starts with an inflation rate -- a "core rate" or "underlying rate" of inflation and inflationary expectations -- that is higher than at the start of the previous cycle.

There is some dispute among economists and other analysts over the degree to which faulty -- excessively expansionary -- government monetary and fiscal policies over the past 15 years have been the key initiating force for inflation, by creating excess aggregate demand, or simply an accommodating force reacting to other pressures. There is wide agreement that this was the initiating factor in the 1965-66 period, as the Vietnam War was piled on top of an already fairly strong economy, without a tax increase to pay for it. But in the 1970's, this causative factor -- excessive growth of the money supply and large budget deficits -- is interrelated with supply shocks and structural changes in the economy which have also contributed to the problem.

II

THE COST OF FIGHTING STAGFLATION

As inflation has proved to be seemingly intractable, the society at large has developed inflationary expectations. These expectations change behavior in such a way as to contribute to the continuation of inflation -- a good example being cost-of-living escalators in wage contracts, business contracts and government programs. Insofar as these contractual and institutional changes become entrenched, they may increase the pain and difficulty of combatting inflation. Thus, in the entirely understandable and rational act of protecting themselves against inflation -- or seeking to do so -- people help to perpetuate it. This was not a serious problem when inflation was intermittent and, on the average, negligible. However, the serious inflation of recent years has been far from negligible. It has become a severe economic and political problem. A sort of vicious circle has developed. Contributing to inflationary expectations and behavior is the widespread view that the government either cannot or will not stop inflation. As the short-run political and economic costs of fighting the increasingly entrenched inflation have mounted, the government has been increasingly reluctant to act. Now, however, the long-run political and economic costs of *not* fighting inflation are leading economists and policymakers to seek innovative ways of breaking the circle by breaking the inflation without a long period of painful stagnation in the process.

The traditional explanation of the relationship between inflation and unemployment involves a number of factors which tend to make wages and prices flexible on the up-side but which impede efforts to slow the rate of inflation. Upward movements in wages or prices -- whether from legal, institutional, environmental or policy shocks, or from expectations derived from previous inflationary experiences -- are assumed to be irreversible without prolonged economic slack. Unemployment and sluggish sales are assumed to be needed to change the inflation expectations of labor and management. It is further assumed that policymakers will wish to avoid the unemployment by accommodating the upward shocks. This is accomplished by stimulative monetary and fiscal policies to produce sufficient nominal spending to permit the purchase of all available real output at the higher prices.

Various schools of thought differ as to how much inflation can result from expectations alone or random shocks alone, without substantial accommodation by monetary and fiscal policy. There is also disagreement as to the relative effectiveness and permanence of monetary policy versus fiscal policy in altering total spending. Equally important, there is disagreement about the degree of rigidity of inflationary expectations and the real costs of reducing them.

Anti-inflationary fiscal and monetary policies generate unemployment and reduce real output because of entrenched inflationary expectations. For example, if management, workers, borrowers and lenders expect prices to be rising at 7 percent a year, then the contracts they sign for wages, and the price lists they post, will reflect a 7 percent annual increase as a matter of course. Interest rates will contain a 7 percent inflation premium. If economic policy continues to be consistent with 7 percent inflation, these contracts are fulfilled with each party getting what he expected to get in real terms when the contracts were signed.

However, if policies move toward restraint, expectations are not fulfilled. Firms will find the public unwilling to buy as much as the previous year after a 7 percent price increase. The firm may interpret this as a decline in real demand for its particular product, rather than a general adjustment for inflation, and cut back production. Productivity gains aside, workers may meet with layoffs if they continue to insist on a 7 percent cost of living wage increase, yet they will not realize that they are asking for a real wage increase until the general level of inflation has visibly slowed. Borrowers will receive a windfall loss, and lenders a windfall gain, if the rate of inflation drops unexpectedly. Borrowers at inflated interest rates may face bankruptcy, or at least have to retrench, unless they can refinance their debt at a lower rate.

The extent to which inflationary expectations (and the wages and prices which reflect them) are sticky and hard to change determines how much real output and unemployment will result from disinflationary policies, and how long the real effects will last. Historically, the periods of adjustment and the resulting recessions have lasted several quarters.

Considerable research is being done on ways to improve the flexibility of expectations, wages and prices. In theory, if expectations were perfectly flexible, inflationary expectations could be reduced simultaneously with the implementation of fundamental anti-inflationary policy changes. In that case, nominal demand and inflation could be reduced with no real dislocations.

Thus, students of stagflation tend to be either relatively optimistic or relatively less optimistic about the prospects of finding a cure for the problem without a prolonged period of painful unemployment and reduced economic growth and living standards. The difference of opinion stems from different views of the causes of stagflation and the potency of the various policy weapons available to fight it.

The relatively optimistic school emphasizes the role of excessively stimulative monetary and fiscal policy in the inflation process, leading to the development of inflationary expectations which form a stubborn core rate of inflation. To this core rate would be added external shocks such as sudden oil price increases. The inflation generates increased tax rates which, coupled with increased regulatory barriers and reduced energy availability, have resulted in slow real growth or actual recession.

The relative optimism of this view stems from the hope that a different set of policies -- designed to restore incentives in increased productivity and work effort, and to replace or otherwise reduce the need for lost energy resources -- may turn the real economy around. It is further hoped that an improving real economy and higher productivity can reduce inflation and inflationary expectations. This would aid in the further reduction of inflation by fiscal and monetary policy with less economic sacrifice than might otherwise be required.

The relatively less optimistic school emphasizes the stubbornness of core inflation. Its basic view is of a cost-push inflation which has been accommodated only reluctantly and partially by monetary and fiscal policy, leading to slower real growth or recession. The inflationary spiral is thought to be deeply rooted in the structure of the economy. In particular, it is felt that labor and management are confident that increased wage or price demands are unlikely to generate substantial unemployment or lost sales. Political pressure will lead the government to intervene to "ratify" the increased wages and prices, rather than risk recession or depression. This leads to the view that wages and prices can go up easily, and down rarely. These forces are compounded by external shocks, such as the oil crisis. Efforts to restrain the process involve higher interest rates and taxes which have the unfortunate side effects of reduced investment and productivity, which only make inflation worse.

The relative pessimism of this school stems from the view that the ingrained structure and attitudes found in the economy, and unavoidable and intractable external problems, are the chief causes of stagflation. In this view, government policy has not been the major contributor to the problem, and so a reversal or redirection of policy will produce no major easing of the problem over the short term.

Can We Afford Not to Fight Stagflation?

Stagflation is clearly America's most serious economic problem, in that it describes a progressive worsening of economic performance. The problem, of course, is in two parts -- stagnation and inflation. To some extent, they are related.

The traditional view of a trade-off between inflation and unemployment is still alive and well when it comes to the short-term effects of trying to reduce inflation. However, the very existence of stagflation has led to a realization that in the long run, inflation and unemployment may not only coexist, but reinforce each other.

Inflation and the tax code interact to reduce output and foster unemployment and stagnation. In the Keynesian view, inflation automatically makes fiscal policy more restrictive, chiefly because under a progressive personal income tax system, average tax rates and tax revenues rise faster than incomes (tax bracket creep) and total purchasing power is thereby reduced. In the classical view, this effect is analyzed somewhat differently. The rising marginal tax rates are seen as reducing the after-tax reward or incentive to individual saving and work effort, and reducing economic growth.

In the corporate sector, the inflation interferes dramatically with depreciation. The tax code permits a tax deduction only of the historical cost of plant and equipment. When inflation increases the cost of new plant and equipment, the firm finds that the money it has set aside for replacement is inadequate. It must use taxable income to supplement its depreciation allowances just to maintain its productive capacity -- just to stand still. Thus, actual economic depreciation is understated, and corporate profits are overstated. Inflation "disallows" the deduction of a real cost of doing business, increases the firm's tax liability, reduces the rate of return on investment, and reduces the firm's desire and ability to grow.

Stagnation and declining productivity can in turn worsen inflation. For any given fiscal policy and rate of money growth, the less that real output increases the higher the rate of inflation will be as fewer real goods and services appear to satisfy the nominal demand. Falling productivity and real wages cause people to scramble even faster to protect their share of a shrinking pie, causing sharp disputes between labor and management, and putting pressure on government to try to inflate the problem away.

Thus, to some extent, policies that reduce inflation will help spur economic growth, and policies that spur productivity will contribute to lower inflation and lower inflationary expectations. Furthermore, it is clear that action must be taken. Failure to address the inflation problem will cause as much distress on the employment and real income fronts in the long run as would an attempt to battle inflation in the short run.

III

WHAT IS TO BE DONE?

Although stagnation and inflation are interrelated, each can exist without the other. Neither can be completely cured without specific attention to its chief causes. In fact, it is a general rule in economics that two policy targets can be "hit" only if there are policies that are relatively specific to each target, policies that can be used to solve one problem without making the other one substantially worse.

For a number of years, the Joint Economic Committee has recommended a policy mix designed to address inflation and stagnation simultaneously by addressing both the demand and supply sides of the economy. Instead of putting all policy tools on "stop" to fight inflation, or all on "go" to fight stagnation, the various fiscal and monetary policy tools would be used separately to address the problems over which they had the most influence. The goal is the disinflation of nominal demand while encouraging the growth of real output and employment.

Monetary policy would aim at reducing nominal demand and inflation. A gradual reduction in the growth rates of the monetary aggregates over time to levels which match the rate of growth of real output is essential if inflation is to be stopped.

Fiscal policy would be used in two ways.

First, the rate of growth of government spending would be reduced. This would reduce nominal demand while freeing up real resources for the private sector to use to increase investment, productivity, economic capacity and the real supply of goods and services.

Second, tax policy would be used to create incentives to encourage the private sector to work, save and invest, expanding the supplies of labor, capital and real output. Its main emphasis would be on combating stagnation and promoting real growth.

In traditional stop and go policy, this splitting of fiscal policy to address separate problems was never done. It was at one time thought to be an inconsistant approach. Would not a tax cut worsen the deficit? And would this not defeat the attempt to reduce inflation by cutting spending and cutting the deficit? This concept of the deficit as the primary statistic to watch is at the heart of the rigid and counterproductive stop-go policies of the past.

It is true that the government can reduce interest rates and make additional funds available for private sector growth by reducing government spending to lower the deficit and reduce federal borrowing. However, a tax rate increase to reduce the deficit would be counterproductive. Tax rate increases reduce corporate and personal saving by reducing the after-tax return to saving. The deficit per se does not determine the degree of crowding out or inflation. Rather, it is the relationship between the deficit and the supply of saving to finance it without inflationary creation of new money that determines the impact on inflation. In fact, a tax change that created a bigger jump in saving by individuals and firms than it costs in revenue would produce "crowding in", lower interest rates, less inflation and more real growth.

This study turns now to a more detailed consideration of these policies.

Fiscal and Monetary Restraint

It is widely agreed that there is no hope of reducing inflation if huge budget deficits (particularly at times of high employment) and rapid expansion of money and credit are pumping up aggregate demand relative to the economy's capacity to supply goods and services. Yet, a policy of simply restraining demand to keep the economy in more or less permanent state of slack and excess unemployment until inflationary expectations are reduced is a painful process. Indeed, this is the acute dilemma of stagflation: Restricting demand is likely to cut output and employment much more than prices for an extended period of time

The view that demand restraint alone will have more short run impact on output than on prices is the conclusion of numerous studies by Eckstein, Perry, the Congressional Budget Office and others, and is now the conventional wisdom. There are dissenters, such as Fellner, who argue that once the public becomes convinced that a cautious monetary and fiscal policy will be followed for a sustained period, inflation could decline quite rapidly, including the rate of wage increase. What is indisputable is that the United States has not yet tried a "steady" policy of restraint. In short, a policy of demand restraint alone has an immediate cost in the form of higher unemployment, subpar growth and less investment, and only an eventual payoff in the form of reduced inflation. Yet, it may be the best single hope for curing the inflation disease.

Reforms on the Supply Side

To make the policy of restraining demand politically bearable, and to promote continued real growth while reducing inflation, emphasis must be put on the supply side of the economy by at least one major policy tool. For several years the Joint Economic Committee has emphasized that the stagflation problem results in part from too much emphasis over the past three decades on managing nominal demand and not enough on improving real supply.

This is not to say that better performance on the supply side and faster productivity growth can eliminate inflation by itself. For example, if real output is growing at 4 percent a year and the money supply is growing at 12 percent, then roughly 8 percent inflation could occur over the long run. An increase in productivity growth which caused an increase in the growth of real output to 5 percent a year would lower the inflation rate only to 7 percent. The remainder of the inflation would have to be eliminated over time by a reduction in money and spending growth rates. Thus, supply side policies are aimed primarily at the stagnation part of stagflation.

However, the productivity increase is more important in reducing inflation than it may appear to be from this type of example. A rise in productivity growth and a drop in the rate of inflation would help to change inflationary expectations. The rise in productivity growth would enable the Federal Reserve to take the first step in reducing the growth of the money supply with no adverse effect on real output, since inflationary expectations would already be declining. If the inflation rate were expected to continue to fall, the Federal Reserve could continue to move toward its noninflationary long-run targets with far less impact on the real economy than traditional analysis would fear, and there would be far less political pressure on the government to reflate spending.

Particularly crucial in this respect is achievement of a higher level of capital formation -- with a payoff in higher growth and improved productivity -- which in turn almost certainly requires a higher level of saving. Tax policy is clearly central to the process. By definition, a tax policy that tilts the balance toward business capital formation and personal saving can do so only at the expense of current consumption. But insofar as the result is a higher rate of growth and improved productivity, living standards soon are higher even though the share of consumption in the total gross national product is less than before. The menu of potential tax changes is long and will not be fully explored here, suffice to say that there appears to be an emerging consensus that a tax policy aimed at improving supply and productivity is essential to the restoration of rising living standards and employment, and a valuable long-term weapon in reducing inflation. The payoff, however, will not be instantaneous.

Two studies are especially interesting in light of the recent stress on the use of tax policy to influence the supply side of the economy rather than the demand side.

A study by Data Resources Incorporated (DRI) investigated policies designed to offset the adverse effect of inflation on the willingness and ability of business to invest.* The study assumed that the rate of return to investment and the cash flow positions of firms were both improved by increasing the investment tax credit by 2.7 percentage points, and that the average tax life of producers' durable equipment was shortened by four years, all beginning in 1980. Furthermore, to isolate the supply effect from demand influences, it was assumed that monetary and fiscal policy remained neutral over all, with restraint in other areas exactly balancing the demand impact of these tax reductions.

The study predicted that, compared to what otherwise would have happened, real business fixed investment would be up 5.7 percent by 1981 and 15.5 percent by 1990, raising the capital stock by 3.5 percent by 1985 and 7.2 percent by 1990. The higher capital stock would increase potential GNP by 1.1 percent and productivity by 1.2 percent by 1985. Wages would be up 0.9 percent by 1985. Most significantly, the core rate of inflation would be 1.3 percent lower by 1990. Thus, fairly modest tax changes were found to reduce unemployment, raise wages and real output, and reduce the supposedly intractable core rate of inflation simultaneously. The key, of course, is careful design of a consistent program of effective tax changes and restrained spending and money creation.

A study conducted for the SSEC explored the neoclassical approach to tax policy. The study places even more emphasis on the use of tax changes to change behavior through alteration of incentives, rather than by increasing or retarding aggregate demand. In the neoclassical view, tax policy works primarily by reducing marginal tax rates, improving the after tax rate of return to added saving, investment and work effort at any given level of before tax wages or interest rates. This is assumed to induce a shift by individuals and firms away from leisure and consumption uses of their time and income into greater work effort, saving and investment uses, increasing productive inputs while reducing costs. Only by expanding the willingness of the suppliers of labor and capital to participate in production can the supply of real output be increased, and only then is added real income available to the population.

---

* Otto Eckstein, "Tax Policy and Core Inflation," Joint Economic Committee, April 10,1980.

The SSEC study just cited* rejects the idea that tax reductions can have any direct impact on disposable income, on the grounds that tax cuts which have no incentive effects are simply borrowed back to finance the federal deficit resulting from the tax reduction. Only if the tax reductions are of the form that encourage additional saving and added supplies of labor will higher output occur. However, the study emphasizes that carefully designed tax rate reductions can substantially increase the desire to save and invest, and that the real economy can move forward while nominal spending and inflation are reduced.

The emphasis in the supply side reforms noted above is on inducing a switch in the American economy away from consumption and toward saving and capital formation to improve the long-run growth potential of the economy and, along with it, output per hour worked.

Tax changes are the central tool in an attack on the supply side of the economy, and there is growing support for supply-oriented tax reforms. However, an important caveat is in order. Tax "reform" means, in this context, tax reduction -- more rapid depreciation allowances for tax purposes, bigger investment tax credit, lower corporate tax rate, reduced marginal personal income tax rates on the income from labor and savings, etc. But tax reduction is not free. While some of the revenue loss is offset to the extent that tax changes lead to more rapid growth and higher employment, most of the available evidence suggests that this added revenue cannot fully compensate for the initial tax cuts, certainly not rapidly. And, thus, tax reduction to foster capital formation may appear to conflict with one of the major tools for dealing with

* Norman B. Ture, "The Economic Effects of Tax Changes: A Neoclassical Analyses," Volume V, SSEC.

the inflation problem -- a tight fiscal policy, with budget deficits kept under better control than has been the custom in much of the past 15 years.

As mentioned above, increased saving will be of major help in funding any residual deficits from supply-oriented tax reductions. In addition, it would be of great benefit if a reduction could be achieved in the growth rate of government expenditure. Another paper in the Special Study notes that the most rapid growth in Federal Government spending has come in two areas -- transfers to individuals and grants-in-aid to State and local governments -- which in turn are oriented toward consumption (including current government services) rather than investment.* What is more, in a graphic illustration of the circular nature of the problem, nearly all of the main transfer programs are not indexed to inflation and thus have their own built-in growth as long as inflation persists. A decision to foster capital formation not only means a change in the tax system per se -- for example, corporate tax cuts at the expense of consumption-oriented tax reduction for individuals -- but probably also means painful pruning and tight control of what are among the government's most popular programs. Yet, many programs -- in particular the pension programs and Social Security -- would be made far more secure by a decade of solid economic growth, and all Americans would benefit from increased job opportunities, lower prices and more goods on the shelves.

More Inflation-Consciousness

In addition to tax reductions to lower production costs, something must be done about regulatory and other legal barriers to price reductions. The list here is familiar and largely self-explanatory: Farm price support policy, import restrictions, employer payroll taxes, minimum wage, support policy, import restrictions, employer payroll taxes, minimum wage, anti-competitive regulation in transportation, etc. Frequently, government decisions in these areas -- always made seemingly for some good reason -- have the effect of raising costs and prices.

In addition, there is the newer problem of government regulations in the areas of health and safety and the environment. Most of these regulations unavoidably impose costs on the private sector. There is increasing recognition that tradeoffs are involved and that an assessment of the costs, regulation by regulation, should be an important element in the final decisions. Some have advocated a regulatory budget which would set limits each year on the total costs that could be imposed upon industry by new regulations. In general, while the inflationary effect of each "micro" decisions of the government is small, cumulatively the impact can be large, and it was particularly large in the 1977-78 period when there were decisions on minimum wages, payroll taxes, import restraints, farm prices and costly new regulations almost simultaneously.

---

* See Ronald L. Teigen, "Trends in the U.S. Federal Budget 1947-78," printed in Volume VI, SSEC.

Mandatory or Voluntary Wage and Price Guidelines

The policies mentioned in previous paragraphs apply directly to the fundamental determinants of demand and supply. Without those policies, no real progress can be made against inflation and stagnation. Mandatory or voluntary wage and price guidelines are clearly incapable of substituting for a reduction in the rate of money creation or an increase in the quantity of goods on the shelves.

The only possible value of such programs, it is generally conceded, is in alerting the public to the changes in the more fundamental policies in an effort to change inflationary expectations more rapidly than might otherwise occur. The goal would be to minimize the impact of disinflationary policies on the real economy.

Wage and price controls are in and of themselves a form of rigidity. Insofar as they are binding, they tend to distort the allocation of labor, capital and output, creating shortages and interfering with economic growth. This is a high price to pay for the limited reduction in inflationary expectations that controls, which have too often substituted for basic policy action rather than supplemented them, may provide.

A clear statement of a comprehensive monetary, spending and tax program designed to reduce inflation, followed by carefully and sustained implementation, is probably the most effective and quickest way of changing inflationary expectations for the better.

Nonetheless, these optimistic developments in the theory and policy of dealing with stagflation are not a panacea. It should be evident that controlling inflation will take time. Inflationary expectations are now deeply embedded in the society. Most external shocks, almost by definition, are beyond control, as the unhappy experience with OPEC-determined oil prices in the 1970's demonstrated, and government tends to accommodate them. To the extent that government regulations in the health, safety and environmental area are a new factor in pushing up costs and hence prices, they also reflect a national choice that these problems should be tackled and they are not going to disappear.

In addition, there is the ever present impact of inflation increasing tax rates and production costs. Thus, the following chapter of this paper describes the traditional and less optimistic elements in what can be called the "stagflation process."

IV

ONE VIEW OF THE PROCESS

A good way to tackle the explanation is through a series of key terms, which together paint the portrait of the stagflation process, based on the assumptions of rigid expectations and accommodation by monetary and fiscal policy.

Assymetry

When demand rises and the economy is operating near its capacity, prices go up, as they always did. But when demand falls, and unemployment rises and machines are idle, the general price level does not go down as it used to do. That is *assymetry*.

Some prices, of course, still do decline with falling demand or excess supply. These are principally the prices of raw materials, agricultural and nonagricultural, where there are numerous producers and where prices are often determined on commodity markets rather than being "charged" or fixed by the seller. During the past decade, there have been significant declines (as well as increases) in such items as sugar, copper and beef, for example.

But for a broad array of prices, it is evident that a given reduction of demand and emergence of excess capacity does not bring about the same reduction of prices or reduction in the present rate as was common in earlier periods. Quite apart from the poor performance of the stagflating economy of the 1970's, the earlier years of the post-war period -- while they showed good performance over-all -- almost never showed a *reduction* of the general price level. Inflation was either mini or maxi, mostly mini, but it was always inflation.

This paper is not the place for a full explanation of assymetry. But the main factors can be mentioned.

The most debatable is growing concentration, or oligopoly, a condition of few producers in which output can be reduced rather than prices cut in response to a decline in demand. Actually, while there has been some increase in concentration of total manufacturing assets in the past three decades, largely because of conglomerate mergers, there has apparently not been a significant increase in concentration in most industry sectors. There are only a slightly smaller number of producers of steel, automobiles, tires, chemicals, pharmaceuticals, paper or breakfast cereals today than there have been for many years. The massive and continual upward movement of prices cannot be explained by minor and occasional shifts in market power.

A more important explanation is the set of changes in the economy, and in government policy, that have abolished --certainly in the post-war period to the present -- the deep and lasting depressions that once were familiar. Depressions, and their accompanying deflation, are simply not *allowed* to happen. Governments can take action, such as tax reduction or higher spending, to prevent a cyclical downturn from becoming a full-fledged depression; probably more important, other features of the modern economy -- bank deposit insurance, automatic unemployment compensation, farm price and income supports, the larger share of government in the total economy -- have made it more depression-resistant. In any case, recessions in the post-war economy, while they have varied in depth, have all been brief. If sellers expect that a period of reduced demand will be temporary, and that inflation will continue, then sharp price cutting is not the most sensible response. And if governments behave as expected, demand will in fact rise to offset, or more than offset, any tendency for prices to slow their rate of growth.

Perhaps most important, there is the failure of *costs*, particularly labor costs, to decline or slow their rate of growth when demand is weak and business is poor, and the addition of new kinds of costs through government regulation that continue through good times and bad. If costs do not decline during a period of slump in the economy, there is obviously a limit below which prices cannot fall in response to declining demand. If costs actually keep rising in these conditions, prices can be forced upward even when markets are weak. While economists tend to explain this as a shift in the "supply curve," perhaps the simplest description -- familiar to Americans everyday -- is "markup pricing." Sellers calculate their costs and then set their price.

Competition still prevails through most of the economy, notably at retail, and it continues to be a restraint on price increases. But neither competition nor weak demand can overpower rising costs. One set of costs that is new, as noted, is mandated environmental, health and safety regulation. This affects some industries much more than others, but regardless of its non-economic values, it adds to the total rate of inflation. The other, more pervasive, cost element is labor costs, which leads to the second key term in the lexicon of stagflation.

Stickiness

This is the wage counterpart of assymetry in prices. When labor markets are tight, wages rise as they always did. But when unemployment is high, money wages -- and hence the costs that underlie prices -- do not fall quickly if inflationary expectations remain high. In fact, they go right on rising. This is *stickiness.*

A few figures illustrate this striking phenomenon, and the change over time. From the cyclical peak in the economy prior to the 1948-49 recession to the two quarters after the recession trough, the unemployment rate in manufacturing (as would be expected) rose by 4 percentage points; wages did not actually fall, as they might have in a purely classical world, but their rate of increase dropped sharply, by 7.2 points. This response of wages to poor business conditions and slack labor markets became weaker and weaker with succeeding recessions, until the new kind of world came into sharp relief in the deep recession of 1974-75. On that occasion, a rise in the unemployment rate in manufacturing of 6 percentage points was accompanied by an *acceleration* in the rate of wage increase in manufacturing, from 6.6 percent in the period of the pre-recession peak to 9.5 percent in the two quarters following the trough.

Across the economy as a whole (though for few individual firms) labor costs are between 60 and 65 percent of total costs. Thus, it is quite impossible for the average price level to fall as long as labor costs do not fall. A rise in productivity, of course, can partly offset a rise in money wages and moderate the increase in unit labor costs. But even if productivity growth were in the healthy 3 percent range that characterized the first 20 years of the post-war economy, there is no way that total labor compensation costs (including fringe benefits and employer payroll taxes) can rise by 9 percent annually, as they have recently, and at the same time have a stable price level without massive layoffs and declining real output.

It was quite common in the 1920's and 1930's for money wages to fall when business was poor and unemployment high, and much "textbook" theory is based on that earlier world, with a supply-and-demand picture of wages and the labor market and an expected zero rate of inflation. While the present, very different world is not yet entirely explained, there is growing agreement on some aspects of modern wage-setting, and the importance of inflationary expectations.

One is the existence of labor unions -- though, like the oligopoly explanation for the assymetry of prices, this is probably the weakest explanation for modern wage behavior. Less than one-fourth of the nonfarm labor force is organized. There has been no increase in the degree of unionization between the period of relatively mild inflation of the 1945-65 period and the current period of vicious stagflation. Unions do, however, have a kind of "example setting" effect on wage determination generally. They successfully resist wage reductions at times of slump, for example, and their custom (in the United States) of negotiating contracts for two or three years tends to make wages (including wage increases) independent of the business cycle. They have pioneered cost-of-living escalator clauses, which make wages depend on inflationary expectations, based in part on previous inflation, rather than current labor market conditions. In general, to an important but uncertain degree, highly publicized union wage gains serve as an example and influence behavior and expectations in the non-union sectors of the economy.

A second explanation is a parallel to the same phenomenon on the price side -- the ability and determination of the government to prevent severe and prolonged depressions, and the expectation that wages and prices will continue to rise. This means, in brief, that today's labor surplus (when employers might be tempted to cut wages) may be tomorrow's labor shortage.

The period of surplus will not last long. An employer has a stake in a reasonably stable labor force, and he risks losses if he uses his economic power to reduce wages during temporary periods of high unemployment. Furthermore, the emergence of unemployment compensation, public assistance and food stamps clearly reduce the terror of layoffs and thus the bargaining power of a purely "economic" employer. Workers are in a stronger position to accept layoffs in lieu of a cut in wages, as was common in the past. Expectations play a key role. Employers and workers both will be willing to pay or demand rising wages when prices are expected to climb.

Finally, there is the practice described by the late Arthur Okun as "the invisible handshake," which helps to describe the wage process in the huge nonunion segment of the economy. Without any binding contract, employers offer "equity-oriented wages" -- meaning a wage which both sides regard as in some sense "fair." The employer does this in the interest of maintaining a reasonably contented labor force with a minimum of turnover.

A key aspect of equity-oriented wages is that employers do not use slumps in production and profits to cut wages; another key part, to be examined later under "feedback," is that a fair wage at present automatically means a rising wage, because of previous inflation of prices. This, again, is an explanation for the divorce between wage determination and the state of the labor market. A piece of anecdotal evidence reinforces the point. Of some 30 employer or employer organization comments received by the Council on Wage and Price Stability in 1979 on proposed second-year wage standards under the Council's nonmandatory programs on price and wage restraint, 90 percent urged that the standards be *liberalized* -- i.e., that the employers be permitted to grant larger wage increases than under the previous standard. Obviously, employer behavior is different in modern times from what classical economists would prescribe.

Assymetry and stickiness are the "structural" or behavioral characteristics of the economy that make stagflation possible. But they are not altogether new, in the sense that they did not suddenly burst upon the scene in the 1970's. The final part of the stagflation story includes the remaining terms that round out the explanation.

External Shocks

Some might use the term "exogenous shocks" -- something that happens outside the system. The price level can rise, as always, from a condition of excess domestic demand, which in turn is usually attributable to faulty government monetary and fiscal policy. How much this "classic" cause of inflation has been responsible for modern troubles is a matter of dispute. But there can also be major increases in *particular* important prices, and hence, when accommodated, in the average of all prices, as a consequence of outside factors. The vulnerability of the United States to these external events has been increased somewhat by the near-doubling in the past 15 years in imports as a proportion of the gross national product.

The explosion of world oil prices in the 1970's is the perfect example of an external shock -- and the United States could not insulate itself from the shock because it now depends on imports for nearly half the total supply. Another example is the occasional run-up of world grain prices (and eventually consumer food prices) because of bad harvests, not only at home but abroad. A third, which occurred in 1973-74, is a surge in prices of virtually all non-food, non-energy raw materials because of a simultaneous boom in the industrial economies. Yet another is the inflationary price impact at home of a declining exchange rate of the Nation's currency. If, because of capital movements, the exchange rate declines by more than is necessary to reflect excess inflation in the United States compared to that abroad, not only does the cost of imports (now more important than they used to be) increase, directly affecting the price level, but also domestic producers of products competing with imports (such as steel and automobiles) find it easier to raise their prices. There can even be a third effect from excessive declines in exchange rates -- an increased foreign demand for many exports (lumber, for example) which pulls up the domestic price.

While all of the above mentioned items have been important from time to time during the past decade, oil is a case by itself because of its pervasive importance. The rise in prices of petroleum affected consumer prices directly, with the price of gasoline approximately tripling during the decade, and it also affected costs (and hence eventually prices) for virtually all industries. This was because the increase in foreign oil prices gradually pulled up the price of all other sources of energy, including domestic oil, coal, natural gas and electric power. There is no doubt that if oil production had been sufficient in the 1970's to keep oil prices reasonably stable, and the accommodating movements in monetary and fiscal policy had not occurred, inflation would have been much lower.

Also regarded by economists as in the category of "external shocks," though they do not stem from events outside the country, are specific government "micro" actions that have the effect of raising costs and prices. Examples are increases in the minimum wage, increases in employer payroll taxes, higher floors under farm prices, and restraints through tariffs or quotas on specific imports. New "social" regulations (environment, health and safety) have the same effect. Each of these actions has its own justification, even merit. But they can all add to the inflation rate quite independently of the general rate of aggregate demand.

Feedback

In the classical picture of the economy, no individual price increase, no matter how important, can be of major concern. Provided aggregate demands were held the same, the rise in some prices would be matched by a fall in others and the general price level would not rise. But as noted, in modern conditions other prices sometimes do not fall; output falls instead. Just as important, when the average price level goes up, for whatever reason, wages soon follow. This is *feedback*.

The price shocks mentioned above were all sufficiently important to affect the general price level -- specifically, the consumer price index -- and inflationary expectations, and they were soon followed by a ratcheting upward of the average level of wage increases, both union and non-union. This feedback is the counterpart on the upside of wages to stickiness on the downside.

It is precisely what happened in 1974-75. Even though unemployment rose steeply, wages for a while rose even more rapidly than they had in the preceding period of reasonably full employment. They were reflecting the double-digit inflation of late 1973 and 1974, which in turn was strongly influenced by the rise in world oil, food and raw material prices -- all "external shocks." Because of inflationary expectations, later ratified by expansive monetary and fiscal policy in 1976 and 1977, the rate of wage increase did not drop all the way back again once the exogenous cause of the price increase had disappeared.

A higher general or "underlying" rate of inflation persisted after oil or food prices stopped rising so fast. In 1975 and 1976, oil prices virtually stabilized and food prices even declined a little, but by the end of 1976, the ongoing rate of inflation -- as measured, for example, by unit labor costs -- had risen to about six percent from only about half that rate in the 1971-72 period, though the unemployment rate remained high at over 7 percent. The inflation "ratchet" had moved up another notch.

The fact that wages now clearly rise to reflect the preceding inflation does not mean that wages cause or even fully keep up with inflation. Real weekly wages per worker were lower at the end of the decade than they were in 1973. The oil price increase alone made unavoidable some loss of real income. But the movement of real wages is not the point here. It is money wages that determine money costs and hence prices. The fact that wages go up -- even if they do not fully catch up to prices -- is what matters for the rate of growth of costs and therefore efforts to slow down the growth rate of the general price level without substantial unemployment.

The foregoing discussion of expectations and its relationship to assymetry, stickiness, external shocks and feedback helps to explain the "flation" part of stagflation. It shows why inflation can stubbornly resist efforts to cure it through classic monetary and fiscal restraints on total demand. The factors cited do not, of course, yield any judgments or conclusions on whether monetary and fiscal policies during the decade of the 1970's were the "right" policies, or on whether they fought inflation with sufficient vigor. Some would regard monetary policy, in particular, as an important contributing factor to recent inflation, and at the very least monetary policy "accommodated" the inflation that originated elsewhere -- whether from wages or oil prices. The description of the "flation" part of stagflation in the modern economy does not mean that the classic tools are unimportant, nor does it absolve them from blame. But it does help to explain why their task is so very difficult.

The last element in the glossary of stagflation pertains to the "stag" part. It must be reiterated at this point that, while inflation was a problem in greater or lesser degree all through the decade, stagnation was not. There were years of good growth in production and incomes, and, above all, employment. To that extent, "stagflation" is a misleading term if it is taken to mean a *constant* condition of both stagnation and inflation. But it remains true that, even on the growth side, the decade of the 1970's was hardly a happy one.

V

PRODUCTIVITY

No nation can achieve economic growth without limit. The usual statement of the constraints is that a nation's potential output is limited by two factors -- the growth of hours (or days or weeks) worked, and the growth of output per hour worked, or productivity. From 1969 to 1979, total output in the United States (real gross national product) rose by a seemingly respectable 33 percent. But this was a period of unusually rapid growth of the labor force -- 25 percent during the decade -- not only as large numbers of young people entered the labor market but also as more and more adult women chose to work.

Meanwhile, productivity performed increasingly poorly, with the result that the bulk of the growth of output reflected more hours worked rather than more output per hour. Put another way, the Nation's economy should have grown a good deal more than it did during the 1970's, given the rapidly growing labor force. It was not "stagnant" in the sense of no growth at all, but it was distinctly subpar. More important, it is productivity improvement that permits real incomes per worker to rise, by allowing higher wages without a corresponding rise in unit labor costs and hence prices. Measured by the growth in real income per worker, the decade of the 1970's was stagnant indeed.

For convenience, productivity is usually measured in labor terms -- output per hour worked. But it is not intended to be merely a measure of labor "effort," though that can be important. Improvements in productivity come about because of new technologies, greater skill in the labor force, more capital (machinery and equipment) per worker, improved organization of production, and other factors. Measured productivity can improve simply from a shift in occupations, with more people working in high-productivity industries and fewer in low-productivity industries; for example, up to the late 1960's, the shift of workers from farms to industry added to average productivity growth, but that favorable factor has now all but ceased.

Apart from all other secular factors, productivity is subject to cyclical influences, tending to improve most when demand is strong and output growing briskly, and vice versa. The sluggishness of business conditions during parts of the past decade, with factories operating well below their capacity, was one explanation for the poor productivity figures, though there is some disagreement over how much worse the 1970's were than preceding decades in this respect. In any case, productivity is always at its worst during recessions and at times like 1979 when expansions are nearing their end. As a particular example of the important connection between productivity improvement and expanding demand, the once-excellent productivity record of the electric and gas utility industry worsened in the 1970's chiefly because the growth of demand -- held back by sharply rising energy prices -- slowed markedly.

It is partly because of the many elements that enter into productivity improvement that there is no *single* explanation of what has gone wrong in recent years. There is also a problem of measurement particularly in such industries as construction. But there is no dispute that U.S. productivity growth since 1973 has been far below the historical norm, and it was actually negative in 1979.

One partial explanation that is on almost every list is a significant reduction in the amount of capital per worker added each year. Business investment in plant and equipment in the United States was not weak during most of the 1970's, either in absolute volume or as a share of the GNP (though it has long been lower in the United States than in many other industrial countries as a share of GNP).

The problem was that the labor force grew so fast that capital could not keep up, given the existing patterns of taxes, inflation, and personal and business saving rates. The net stock of nonresidential fixed capital per person employed, which has risen historically at a rate of about 2.5 percent a year, showed a slower increase in the first half of the 1970's and has actually declined a little since 1975. In addition, some part of capital outlays now is required for compliance with environmental, health and safety regulations and does not add to output as usually measured.

One school of analysts is convinced that the steep rise in the relative price of energy has been of major importance in the productivity slowdown, partly by making much existing plant and equipment either obsolete or less than optimally efficient. It is certainly true that other industrial countries -- while their productivity performance in nearly all cases is better than

America's -- have also witnessed a slackening in productivity growth roughly coinciding with the explosion of energy prices that started in 1973.

Other areas of the SSEC also explore causes of productivity decline, especially the Research and Innovation and the Productivity studies.

Whatever the explanation, a poor productive performance has been a central element of stagflation, both "stag" and "flation." Whatever the future holds for inflation, it is apparent that steps must be taken to improve productivity if living standards are to rise and the United States is to regain its place as the undisputed leader of the free world.

Contents of Volume

The following outline contains a list of titles and authors of papers which will appear in the final printed volume of the Stagflation section.

A. Diagnosis of Stagflation

1. Stagflation: Causes and Cures (Thomas Dernburg, Senate Banking Committee)
2. The Post-Keynesian Interpretation of Stagflation (Alfred Eichner, Rutgers)
3. Institutional Inflation (Janos Horvath, Butler University)

B. The Money and Credit System in a Stagflation Environment

1. Regaining Control Over an Open-Ended Money Supply (Albert Hart, Columbia)
2. Monetary Disequilibrium Theory in the First Half of the Twentieth Century (Clark Warburton, formerly FDIC)

C. Changing Economic Behavior in a Stagflation Environment

1. Inflation and Labor Force Participation (Norman J. Simler, University of Minnesota, and Alfred Tella, Bureau of the Census)
2. Stagflation, Macroeconomic Policies, and the Non-Inflationary Rate of Unemployment (Michael Wachter, University of Pennsylvania)
3. Accelerating Inflation and the Distribution of Household Savings Incentives (Edward Kane, Ohio State University)
4. The Distributional Effects of Inflation and Their Implications (Joseph Minarik, Brookings)
5. Is There a Shortage of Saving in the United States? (Paul Davidson, Rutgers)
6. The Economic Effects of Tax Changes: A Neoclassical Analysis (Norman B. Ture, Economic Consultant)

Authors of Selections

THOMAS DERNBURG, *Senate Banking Committee*
ALFRED EICHNER, *Rutgers*
ALBERT HART, *Columbia*
JANOS HORVATH, *Butler University*
JOSEPH MINARIK, *Brookings*
EDWARD KANE, *Ohio University*
PAUL DAVIDSON, *Rutgers*
NORMAN B. TURE, *Economic Consultant*
MICHAEL WACHTER, *University of Pennsylvania*
NORMAN J. SIMLER, *University of Minnesota*
CLARK WARBURTON, *late of the FDIC*
ALFRED TELLA, *Bureau of the Census*

Participants in Seminars, Contributors of Peer Reviews

MILTON AMSEL, *American Council of Life Insurance*
THOMAS BOZERILLI, *American Association of Retired People*
PHILIP CAGAN, *Columbia University*
JOHN CORNWALL, *Dalthousie University*
DENNIS DRAPER, *University of Southern California*
OTTO ECKSTEIN, *Harvard University*
ALFRED EICHNER, *State University of New York at Purchase*
JOHN HENDERSON, *Congressional Research Service*
EDWARD KANE, *Ohio State University*
HENRY KAUFMAN, *Salomon Brothers*
MICHAEL LAUB, *American Bankers Association*
JONATHAN LINDLEY, *National Savings and Loan League*
JOHN McCONNELL, *Purdue University*
FRANCO MODIGLIANI, *Massachusetts Institute of Technology*
CHARLES NELSON, *University of Washington*
J. CHARLES PARTEE, *Federal Reserve Board*
MILTON SEMER, *Attorney*
MICHAEL WACHTER, *University of Pennsylvania*
ARTHUR WEIMER, *U.S. League of Savings and Loans Association*
JAMES WETZEL, *Federal Reserve Board*
KENNETH WRIGHT, *American Council of Life Insurance*

Index Narrative

Research papers and Congressional hearings in the Stagflation area of the Special Study on Economic Change have examined the problems of sluggish real growth and persistent inflation that characterized the 1970's. Evidence of accelerating inflation and sluggish real growth in output and productivity since the Second World War has led to a wide range of proposals for corrective policies. The Stagflation papers to appear in the final volume are presented in three sections:

Section A, ***Diagnosis of Stagflation***, defines the economic characteristics which have come to be named stagflation, including persistent price inflation, sluggish growth and poor productivity performance. These studies yield a picture of stagflation as an economic process feeding on itself; it resists the "cures" proffered by fiscal policy that had achieved some success in preceding decades.

Section B, ***The Money and Credit System in a Stagflation Environment***, considers how inflation contributed to innovations in financial institutions and markets that complicated the tasks of controlling money and credit.

Section C, ***Changing Economic Behavior in a Stagflation Environment***, examines a wide range of economic responses among consumers, workers, businessmen, savers and investors to the persistent inflation and sluggish growth characterizing stagflation. These changes in a variety of ways made the economic malaise more intractable, while greatly complicating the tasks of policymakers.

Section A: Diagnosis of Stagflation

The stagflation hearings of the SSEC indicated the diversity of views in analyzing the characteristics of stagnation and inflation in the American economy during the last decade. Arthur Okun's statement before those hearings stressed that chronic inflation was not only the outstanding feature of the American economy in the 1970's, but will remain the foremost economic problem to confront policymakers in the coming decade. In his view, the current inflation developed extraordinary virulence over the past decade partly because the American economy rests on structures of "cost-oriented prices" and "equity-oriented wages" that make entrenched inflation difficult to eradicate. Behavior of workers, consumers, businessmen, savers and investors responds to expectations that inflation at relatively high rates will continue into the future. Employers and employees in both union and non-union sectors of the economy have an interest in long-term wage contracts providing cost-of-living increases which can be passed on to consumers in higher product prices.

Okun advocated a three measure "efficient anti-inflationary program:" (a) sufficient fiscal and monetary restraint to defend against excess demand; (b) coordinated Federal Government efforts to reduce private costs of doing business; and (c) constructive measures to obtain price-wage restraint, i.e., a tax-based incomes policy.

Otto Eckstein, in his statement before the stagflation hearings, documented the acceleration of inflation since World War II and outlined a framework for analyzing various inflationary impulses, which add up to the measured inflation rate. The "core inflation rate" is based on long-run trends in unit labor and capital costs, and changes only slowly over time. The "shock inflation rate" is derived from the impact on prices of government intervention, viscisitudes in agricultural harvests and external shocks such as oil price increases. The "demand inflation rate" is based on the level and composition of aggregate demand relative to aggregate supply. Inflationary impulses originating in the demand and shock components feed into the core rate as inflationary expectations influence long-term wage and price contracts.

Eckstein sees the solution to stagflation in (1) more cautious demand management policies to eliminate demand inflation, (2) increased capital formation and R & D to restore productivity performance and slow the core rate, (3) an energy policy to limit OPEC's power to raise oil prices at will, (4) government regulatory policies which minimize inflationary repercussions, and (5) measures to make the economy more competitive.

In his *Stagflation: Causes and Cures,* Thomas Dernburg identifies several sources of stagflation and relates them to historical experience in the United States. First, Dernburg discusses the measurement and meaning of stagflation and attempts to put the 1970's experience into historical perspective. In his view, the most important sources of stagflation are supply restrictions. World food shortages and increases in the cost of energy such as beset the economy in 1973-74 are the clearest examples, while constraints in the labor supply -- particularly for skilled workers -- are also an important source. Such restrictions reduce output and employment as they push up the price level. Inflation imparts a restrictive bias to monetary and fiscal policy that lowers output and employment. In considering policy options, Dernburg believes conventional monetary and fiscal policies generally cannot act to alleviate one component of the disease without exacerbating the other. More appropriate would be a reduction of payroll taxes, the institution of a wage subsidy program, and adoption of a differential minimum wage that would ease the youth unemployment problem. Further, since he believes supply shocks are largely responsible for stagflation, he suggests that these shocks be cushioned by the establishment of buffer stocks of primary agricultural products as well as stocks of coal and oil. Finally, Dernburg urges that the tax system be indexed for inflation.

Alfred Eichner's *Post Keynesian Interpretation of Stagflation* views investment as the key determinant of economic growth, and it is inextricably linked to business pricing decisions and national income distribution. Inflation is generated when growth in nominal wages exceeds growth in real wages. The former are determined essentially by socio-political bargaining processes, while the latter are derived from productivity growth and technology change. Since factors determining price increases are not the same as those determining growth in real output, it is possible to have growth without inflation and inflation without growth. Therefore, a policy which seeks to limit inflation exclusively by curtailing aggregate demand and economic growth will prove ineffective. Cutting the rate of investment -- which generates technology change and growth in productivity -- would only be self-defeating.

Eichner advocates an incomes policy to bring nominal wage increases closer in line with productivity growth. He also proposes an institutional scheme to analyze the nation's long-term investment needs and to initiate policies that would achieve them.

According to Janos Horvath's *Toward a Theory of Institutional Inflation*, stagflation is deeply imbedded in the American economy, because large-scale institutions in the government, business and labor sectors have introduced rigidities that prevent much-needed adjustment. His analysis starts from the perspective of "grants economics" in which subsidies, bounties, tributes and monopoly profits constitute gains in real income to strategically situated groups in the economy. Concentrations of economic power, and/or political influence result in redistributions of national income have little bearing on relative efficiency, productivity or other performance standards. Widespread government regulation at all levels gives rise to implicit grants which in turn introduce rigidities in price, wages and hinder the flow of productive resources. Horvath recommends much closer Congressional scrutiny of government regulation and of restraints on production and supply in the private sector. Policymakers should try to identify explicitly the "gainers" and the "losers" resulting from restraints on prices and output; the transfer, or "implicit grant," should be quantified. Competition should be fostered and regulation reduced wherever possible.

Section B: The Monetary System and Inflation

Regaining Control Over an Open-Ended Money Supply, by Albert Hall, views American financial history as a seesaw contest between financial innovators and monetary authorities seeking to curb inflationary tendencies resulting from innovation. He sees the 1970's as a critical period of institutional transformation and legislative changes affecting the financial system and monetary control. Accelerating inflation in the 1970's spurred innovative financial practices of both business and households associated with the development of "automated transfer services," NOW accounts, repurchase agreements and money market mutual funds, among other devices. These innovations led to rapid growth of "transactions balances" lying outside the conventional definitions of the monetary aggregates which the Federal Reserve had set up for policy targets. To regain control over an "open-ended" money supply, Hart proposes an agenda for monetary reform. This paper was written before Congress passed in March 1980 the "Depository Institutions Deregulation and Monetary Control Act" which corrected some of the problems Hart identified. In the "afterword" to his paper, Hart acknowledges these legislative accomplishments which will eventually eliminate the membership problem and introduce universal reserve requirements among other measures. Still, he cautions, these reforms will be introduced only gradually. Moreover, new, yet unforeseen, innovations may add new types of transactions balances to the monetary aggregates in the future, and these will have to be brought under Federal Reserve control.

Monetary Disequilibrium Theory in the First Half of the Twentieth Century is the last work of Clark Warburton before his death in September 1979, and is published here posthumously. He regards the 1970's as another period of serious monetary disequilibrium in the United States with a long, excessive monetary expansion and chronic inflation, in contrast to the violent monetary contradiction and Great Depression of the 1930's. He sees similarities in the two episodes with respect to (1) faulty economic theory underlying policy, and (2) failure of many economists to understand the basic forces causing both the collapse of the 1930's and the inflation of the 1970's. Warburton argues that the growth of monetary aggregates during the previous eight years was roughly three times the historic growth rate of output and about three times the potential growth as estimated by the Council of Economic Advisers. In view of the unsatisfactory price performance of the past decade, Warburton recommends policy changes emphasizing a strong anti-inflationary stance by the Federal Reserve.

Section C: Economic Behavior in Response to a Stagflation Environment

Simler and Tella, in *Inflation and Labor Force Participation,* examine the effect of inflation on the labor force participation rate and the size of the labor force. The authors believe that labor force participation decisions in the current period are made on the basis of knowledge of the previous period's real wage rates and what nonlabor incomes will be in the future. In the author's view, rising and variable rates of inflation add to inflationary expectations and generate growing uncertainty and anxiety which stimulate a rising net flow of persons into the labor market. This inflation-induced increase in the labor force entails costs in the form of increased unemployment and decreased productivity growth. A comparison of the decade of the 1960's with the 1970's shows that among the economic determinants of the participation rate, changes in the inflation rate have become about twice as important as changes in real wages and nonlabor incomes. The authors make a general policy recommendation that a substantial and continued reduction in the rate of inflation, together with a dampening of inflationary expectations for the future, would contribute both to lower unemployment and better productivity performance.

Wachter's contribution, *Demographic Aspects of the Stagflation Problem,* sees demographic changes in the labor force and population as a central element behind the stagflation of the 1970's. Short-run economic fluctuations trace the traditional business cycle over which many economists have observed the short-run trade-off between unemployment and inflation. In the long-run, however, rates of unemployment and inflation have increased together. He argues that the secular increase in the unemployment rate over the past two decades is largely due to changes in the "sustainable or equilibrium rates of unemployment" and not to inadequate demand. Secularly rising inflation, he claims, is largely due to the failure of government policy. Policymakers systematically underestimate the sustaintable unemployment rate and overestimate the potential output of the economy. Since demographic forces were largely responsible for the actual rise in unemployment, monetary and fiscal stimulus were limited in reducing unemployment. Wachter's research on productivity leads him to conclude that the bulge of baby boom workers entering the labor force caused the slowdown in productivity growth between 1965 and 1973. After adjusting for demographic factors, the decline in productivity is postponed until the 1970's when it occurs even more dramatically. His policy correctives include reform of the tax structure to encourage investment and discourage consumption. To hold down inflationary pressures, the Federal budget should move to full employment balance when the unemployment rate falls to a 6 percent target. The demographic problems in the labor force should be addressed with programs aimed at structural unemployment such as improving the skills of the unemployed.

Accelerating Inflation and the Distribution of Household Savings Incentives, by Edward Kane, describes how households in different economic and demographic groups reallocated their savings in efforts to cope with accelerating inflation. Accelerating inflation has redistributive effects which hurt small savers because of government imposed interest-rate ceilings. Consequently, as Kane shows, all but the wealthiest households shifted their saving into housing and real estate investments, away from traditional savings vehicles. This predominant behavior helps to explain some of the puzzling features of the 1975-79 economic recovery: The dominant role of consumer spending, unprecedented increases in household debt, changing patterns of financial intermediation, improving quality of owner occupied housing and the growing speculative boom in residential real estate.

Joseph Minarik's *The Distributional Effects of Inflation and Their Implications* examines how inflation affects the distribution of income, how individual economic behavior respons to those effects, and what the response imply for national economic performance. Income from property and financial assets suffers more than from wages and salaries during accelerating inflation. Therefore, the elderly and upper income families are hurt proportionately more than wage and salary earners. Thrift is discouraged, while borrowing and consumption is encouraged. Saving tends to flow into housing and unproductive real assets rather than into productive assets. Minarik recommends policies to raise after-tax yields on household savings, tax incentives for productive investment and more liberal treatment of depreciation. He advocates indexation of AFDC benefits and assistance to the elderly poor in particular.

Paul Davidson's primary purpose in *Is There a Shortage of Saving in the United States?* is to clarify the relationship between finance, private sector saving and capital accumulation. If U.S. growth has been hobbled on the supply side, he argues, it is because of a shortage of finance for capital formation, not a shortage of saving. The low observed rates of saving in the American economy during the 1970's are an effect and not a cause of stagflation. If the government were to pursue policies that tilt the economy toward more saving in the short run, the result would be lower aggregate demand which discourages business capital formation. To the contrary, policies which stimulate long-run growth in demand are the basis for business profits which in turn are a primary financial source for capital formation, supplemented by external finance. In Davidson's view, tight monetary policies to curb rising prices of goods and services will choke off the financial means necessary to generate additions to the capital stock that would improve the overall performance of the American economy.

Norman Ture's *The Economic Effects of Tax Changes: A Neoclassical Analysis* draws sharp distinctions between two strategies of fiscal policy. One views fiscal policy as a means to determine aggregate demand and its components for stabilizing growth and inflation in the short run. The other concerns fiscal policy as a means to alter the structure and incidence of the tax system for influencing the aggregate level of output and its composition in the long run. Ture argues that the former approach, which focuses on income effects of tax changes, has neglected the longer term impact of fiscal policy on incentives to work, to save and to invest, with consequently great adverse impact on real growth, unemployment and price inflation in the long term. Tax changes, in Ture's view, influence household and business decisions on the margin by altering relative prices. Thus, tax changes not only affect aggregate demand; structural tax changes can also alter marginal tax rates, even without changes in total tax liabilities or average tax rates, and still have a significant impact on economic decisions at the margin. He does not discard analysis of tax effects on aggregate demand, but rather recommends adding to it the explicit analysis of tax changes and their effects on the conditions of factor supply, i.e., inducements to work, to save, and to invest.

Author's Biographical Data

The following are brief biographies of the authors of selected papers in the Stagflation section of the SSEC.

Paul Davidson is Professor of Economics at Rutgers University. He has written widely on the subjects of monetary policy, economics and national growth and is at the forefront of developing modern, post-Keynesian economic theories to deal with the fundamental structural changes which characterize our economy today.

Thomas F. Dernburg is Professor of Economics at American University and former senior economist at the Joint Economic Committee. He is the author of the widely-used text entitled *"Macroeconomics."*

Alfred Eichner is Professor at Rutgers University and former Professor at the State University of New York at Purchase and Senior Research Associate at the Conservation of Human Resources Project, Columbia University. He has published extensively on business concentration, monopoly, and oligipoly and on manpower and human resources planning. He is a leading exponent of post-Keynesian theory.

Albert Hart is Professor of Economics at Columbia University. He is a preeminent monetary economist, having spent 40 years researching and writing on the subject. His textbook, *"Money, Debt, and Economic Activity,"* is used in money and banking courses throughout the country.

Janos Horvath is Professor of Economics at Butler University. He has a distinguished background in economics, academia, and politics. As President of the National Reconstruction Council of Hungary, he was the chief executive of that country and his familiarity with implicit subsidies and costs in American industry makes him one of this country's leading scholars on that subject.

Edward Kane is Professor of Banking and Finance at Ohio State University. As President of the American Finance Association and a member of the advisory boards of several finance journals, he has unique access and insight into current research in banking and finance. He has broad experience with business, government and academia as well.

Joseph Minarik is research associate at the Brookings Institution. His doctoral dissertation at Yale was on "*A Microanalysis of the Size Distribution of Income*" and he has published widely on the distributive effects of taxation and on income distribution since then.

Norman Simler is Chairman of the Department of Economics of the University of Minnesota. He is regarded as one of the leading labor economists in the country and has published widely on unemployment and inflation. Previously, he served with the Council of Economics Advisors and as an advisor to the American Economic Association.

Alfred Tella has been special advisor to the director, Bureau of the Census, since 1973. Previously he was research professor of economics at Georgetown University and before that he was director, Office of Labor Force Studies, the President's Commission on Income Maintenance Programs.

Norman Ture is President of the Institute for Research on the Economics of Taxation and Adjunct Scholar for the American Enterprise Institute. His record of public service includes membership on task forces and advisory committees serving both Republican and Democratic administrations. He is the country's leading scholar on the subject of the supply-side fiscal effects of tax changes on Federal revenue and economic behavior.

Michael Wachter is Professor of Economics at the University of Pennsylvania. He has a distinguished record of public service, serving as a consultant for the Congressional Budget Office, the Council of Economic Advisors, the Cost of Living Council, the National Commission on Manpower Policy, and the Board of

Governors of the Federal Reserve System. He was written extensively on labor market problems and Federal policy.

Clark Warburton was formerly with the Federal Deposit Insurance Corporation.

The Stagflation section of the Special Study on Economic Change is one of 10 sections of the SSEC. Final printing will include all areas of the special study. Orders for this Stagflation study may be placed by contacting:

Joint Economic Committee
Room G-133
Dirksen Senate Office Building
Telephone: (202) 224-5321

Government Regulation:

Achieving Social and Economic Balance

Joint Economic Committee

Special Study on Economic Change

A staff study

June 1980

JOINT ECONOMIC COMMITTEE

LLOYD BENTSEN, Texas, *Chairman*
RICHARD BOLLING, Missouri, *Vice Chairman*

SENATE

WILLIAM PROXMIRE, Wisconsin
ABRAHAM RIBICOFF, Connecticut
EDWARD M. KENNEDY, Massachusetts
GEORGE McGOVERN, South Dakota
PAUL S. SARBANES, Maryland
JACOB K. JAVITS, New York
WILLIAM V. ROTH, Jr., Delaware
JAMES A. McCLURE, Idaho
ROGER W. JEPSEN, Iowa

HOUSE OF REPRESENTATIVES

HENRY S. REUSS, Wisconsin
WILLIAM S. MOORHEAD, Pennsylvania
LEE H. HAMILTON, Indiana
GILLIS W. LONG, Louisiana
PARREN J. MITCHELL, Maryland
CLARENCE J. BROWN, Ohio
MARGARET M. HECKLER, Massachusetts
JOHN H. ROUSSELOT, California
CHALMERS P. WYLIE, Ohio

JOHN M. ALBERTINE, *Executive Director*
LOUIS C. KRAUTHOFF II, *Assistant Director-Director, SSEC*
RICHARD F. KAUFMAN, *Assistant Director-General Counsel*
CHARLES H. BRADFORD, *Minority Counsel*

SPECIAL STUDY ON ECONOMIC CHANGE

LOUIS C. KRAUTHOFF II, *Director*

GEORGE D. KRUMBHAAR, JR., *Minority Counsel*

BILL R. MADDOX, *Editor*

GOVERNMENT REGULATION:
Achieving Social and Economic Balance

Prepared under the direction of

BERNARD L. WEINSTEIN
Associate Director for Federal Affairs
Southern Growth Policies Board
Washington, D.C.

Contributing directors

DOUGLAS N. ROSS
Senior Economist, SSEC

TIMOTHY P. ROTH
Senior Economist, SSEC

Authors of Selections

THOMAS McCRAW, *Harvard*
ARNOLD WEBER, *University of Colorado*
RONALD BRAEUTIGAM, *California Institute of Technology*
CARL P. SIMON, *University of North Carolina*
ANNE WITTE, *University of North Carolina*
MIRA WILKINS, *Florida International University*
ARTHUR WRIGHT, *University of Connecticut*
ROBERT SHACKSON, *Carnegie Institute*
ERIC STORK, *Purdue*
CHRISTOPHER DEMUTH, *Harvard*
PAUL W. MacAVOY, *Yale University*
DOROTHY M. TELLA, *U.S. Chamber of Commerce*
NINA CORNELL, *Federal Communications Commission*
DOUGLAS WEBBINK, *FCC*
PAUL HORVITZ, *University of Houston*
WARREN GREENBERG, *Johns Hopkins*
WILLIAM DIAMOND, *State University of New York, Albany*
ROBERT FIRESTINE, *Consulting Economist*
THOMAS MULLER, *Urban Institute*
CARL KAYSEN, *Sloan Commission*
CRYSTAL LLOYD-CAMPBELL, *Sloan Commission*
HOWARD BOWEN, *Claremont*
ROBERT HAWKINS, *Sequoia Institute*

Contents of Volume

The following outline contains a list of titles and authors of papers which will appear in the final printed volumes of the Government Regulation section).

Section 1 -- Government Regulation: Trends and Changes.

1. Regulatory Change 1960-1979 in Historical Perspective (Thomas McCraw, Harvard)
2. The Political Economy of Wage-Price Policies (Arnold Weber, University of Colorado)
3. The Role of Antitrust in a Deregulated Environment (Ronald Braeutigam, California Institute of Technology)
4. The Underground Economy: Estimates of Size, Structure and Trends (Carl P. Simon and Anne Witte, University of North Carolina)
5. Foreign Governments and the U.S. Competitive Position: A Perspective on Change (Mira Wilkins, Florida International University)
6. The Regulatory Budget as a Management Tool for Reforming Legislation (Arthur Wright, University of Connecticut)

Section 2 -- Federal Regulation: Industry Performance and Social Goals

1. The Impact of Regulation on the Performance of Industry (Paul W. MacAvoy, Yale University; and Dorothy M. Tella, U.S. Chamber of Commerce)
2. Common Carrier Regulation and Technological Change: The New Competition in the Com-

munication Industries (Nina Cornell and Douglas Webbink, Federal Communications Commission)

3. The Impact of Regulation of Financial Institutions on Competition and the Allocation of Resources (Paul Horvitz, University of Houston)
4. Alternatives to Regulation in the Health Care Sector (Warren Greenburg, Johns Hopkins)
5. Differential Impact of Government Regulation on Large vs. Small Businesses (William Diamond, State University of New York, Albany)

Section 3 -- Federal Mandates

1. The Economic Effects of Federal Regulatory Activity on State and Local Government: Concepts and Proposals (Robert Firestine, President's Commission on Pension Policy)
2. The Fiscal Impact of Selected Federal Actions on Municipal Outlays (Thomas Muller, Urban Institute)
3. Federal Regulation and Higher Education (Carl Kaysen and Crystal Lloyd-Campbell, Sloan Commission)
4. Socially Imposed Costs of Higher Education (Howard Bowen, Sloan Commission)
5. Regulation in the Federal System: What Do We Want From the Intergovernmental System? (Robert Hawkins, Sequoia Institute)

Contributors of Peer Reviews

WAYNE ANDERSEN, *Commission on Intergovernmental Relations*
ROBERT T. AVERRITT, *Smith College*
ROBERT BARTLETT, *Staff, U.S. Senate*
WILLIAM BAUMOL, *Princeton University*
ROSS BEARD, *Arthur Anderson & Company*
W.W. BETTERIDGE, *AT&T*
BARRY BOSWORTH, *Brookings Institution*
DAVID BRENEMAN, *Brookings Institution*
WILLIAM S. COMANOR, *Federal Trade Commission*
ROBERT W. CRANDALL, *Brookings Institution*
ROBERT DILLON, *National Institute of Building Sciences*
BRIAN DITZLER, *National Association of Manufacturers*
BRUCE FITZGERALD, *Council on Wage & Price Stability*
ROBERT L. FOGEL, *General Accounting Office*
LARRY FOX, *National Association of Manufacturers*
LAWRENCE G. GOLDBERG, *New York University*
DAVID GREYTAK, *Syracuse University*
JAMES GRIFFIN, *University of Houston*
PETER GUTMAN, *Branch College, City University of New York*
THOMAS HOPKINS, *Council on Wage & Price Stability*
ELIZABETH JAGER, *AFL-CIO*
DAVID I. KASS, *Federal Trade Commission*
EDWARD KNIGHT, *Congressional Research Service*
ROBERT LEONE, *Harvard Business School*
BENJAMIN F. LOVE, *Texas Commerce Bancshares, Inc.*
KENNETH McCLENNAN, *Committee for Economic Development*
STEPHEN L. McDONALD, *University of Texas at Austin*
JEANNE McFARLAND, *Department of Commerce*
ALLEN MENDELOWITZ, *General Accounting Office*
BARRY MOLEFSKY, *Congressional Research Service*
DAVID PURYEAR, *Department of Housing & Urban Development*
LAURENCE ROSENBERG, *National Science Foundation*
JOHN SAWHILL, *New York University*
LESLIE SIMON, *IBM*
DAVID TARR, *Federal Trade Commission*
DOROTHY TELLA, *U.S. Chamber of Commerce*
RAYMOND VERNON, *Harvard Business School*
ADAM YARMOLINSKY, *Kominers, Fort, Schlefer and Boyer; Washington, D.C.*

The Joint Economic Committee's Special Study on Economic Change (SSEC) was inaugurated under the leadership of then Chairman Richard Bolling (D.-Mo.) and Vice Chairman Hubert H. Humphrey (D.-Minn.), together with Senator Jacob K. Javits (R.-N.Y.), ranking Minority Member.

The study progressed through Mr. Bolling's chairmanship and into the chairmanship of Senator Lloyd Bentsen (D.-Tex.). The goal of the SSEC is to chart the major changes in the economy and to analyze their implications for policymakers.

Volumes of the Special Study on Economic Change

- -- Human Resources and Demographics
- -- Energy and Materials
- -- Research and Innovation
- -- Stagflation
- -- Government Regulation
- -- Federal Finance
- -- State and Local Government
- -- Social Security and Pensions
- -- The International Economy
- -- Productivity

Table of Contents

CHAIRMAN'S INTRODUCTION. i
Senator Lloyd Bentsen

INTRODUCTION, Government Regulation 1

EMERGING THEMES 5

THE EFFECTS OF REGULATION. 9

POLICY RECOMMENDATIONS. 21

INDEX NARRATIVE. 24

AUTHOR'S BIOGRAPHICAL DATA 29

The Government Regulation section of the Special Study on Economic Change, Joint Economic Committee, is one of 10 sections to be released over the next several weeks. Final printing later this year will include all areas of the special study. Orders for this Government Regulation study may be placed by contacting:

Special Study on Economic Change
Joint Economic Committee
Room 1537
Longworth House Office Building
Washington, D.C. 20515
Telephone: (202) 225-5444 or 225-3566

CHAIRMAN'S INTRODUCTION

Senator Lloyd M. Bentsen

Chairman, Joint Economic Committee

Government regulation for too long has been cast in a purely social role as though it should be quarantined from economic scrutiny. No part of the American experience can be afforded that luxury of disregarding *other* crucial elements of this Nation's quality of life.

Regulation cannot abide *apart from* all other considerations; it must be *a part of* the overall strategy to improve living standards. Left as a detached feature of government, the regulatory network smothers economic opportunity.

To properly evaluate its total impact, government regulation must be viewed as both a social *and* economic issue; *social* because most regulation was designed to bring about cleaner air and water, safer jobs, and an improved quality of life; *economic* because these social ambitions command huge and previously uncounted amounts of the Nation's resources.

Early findings of the Joint Economic Committee's Special Study on Economic Change recognized this dual social/economic impact. Subsequently, the Committee's study group determined to find out how the United States can best meet social goals as well as loosen the regulatory noose around the necks of private enterprise. While we would not return to a yesteryear where there existed little concern for the environment, Congress has a responsibility to find a way to give America's business and industry a little breathing room, too.

The special staff study on government regulation being released today attempts to assist Congress in its search for the best solutions. These efforts were guided by the subtitle of the regulation study, "Achieving Social and Economic Balance." To achieve this balance, the study recommends initiation of a regulatory budget. The evidence offered in support of the regulatory budget is powerful in its scope and detail, ranging from the economic impact of regulation to the acknowledgment of massive benefits.

Without hesitation, the study recognizes the benefits of most regulation, and does not trace all economic problems back to regulation. To the contrary, the study emphasizes the tremendous benefits and attempts to guide Congress toward a posture which will bring about more efficient regulatory agencies acting in the public's interest.

In doing so, the study shows that, for the most part, regulatory agencies only consider direct agency administrative costs when calculating the economic effects of regulation. These administrative sums are handsome enough by themselves, having risen to $6 billion in 1980. At that rate, these costs would be $11.5 billion by 1990 and $16 billion in 2000. But despite the size of such budgeted expenditures, they are a small part of the regulatory burden taxpayers must bear.

From the evidence available, compliance costs placed on the economy already are running at more than $100 billion a year -- about one-fifth the size of the Federal budget. These costs are hidden taxes on Americans that do not show up in the Federal budget.

This lack of accountability distorts the costs of government. For example, until there is a regulatory budget requiring that compliance costs be determined, Congress -- regardless how worthwhile the effort -- is only fooling itself by attempting to limit the Federal share of GNP to a certain percentage.

The Federal share of GNP is now calculated at about 21 percent. But that calculation considers *only* the direct dollars going to the Federal Government. Regulation is claiming *another* $100 billion a year in compliance costs paid by industry and business, and ultimately by the consumer through higher prices.

If this $100 billion is added to the Federal share, the U.S. Government is actually commanding 25 percent -- not 21 percent -- of GNP. Should the growth of government regulation continue as in recent years, the Federal share of GNP -- including regulatory compliance costs -- would reach about 31 percent by 1990 and more than 38 percent by 2000 even if the share of the fiscal budget stayed the same.

This unabated regulatory effect on the economy must be brought under control. "Brought under control" does not mean restricting the activities of regulatory agencies. Requiring regulators to do their jobs efficiently is not the same as placing restrictions on them. In this case, "efficiently" means cost-effective, which reguires a regulatory budget.

The benefits of a cost-effective system could help ameliorate some of these regulatory trends:

- During the 1970's -- at a time when the U.S. economy was stagnant -- government regulation experienced its greatest growth.
- In just 15 years -- since 1965 -- the regulated share of the economy has expanded from one-tenth of GNP to about one-fourth in 1979. In 1965, $93 billion worth of goods and services were produced under varying degrees of regulation. By 1979 the total was $358 billion -- four times higher.
- Regulation has helped push segments of the economy off the record books and into the underground economy. Untaxed income alone in 1979 stood at about 14 percent of national income.
- Regulation has contributed significantly to America's increased dependence on foreign crude oil.

A regulatory budget, which brings with it cost-effectiveness, provides that Congress establish the total amount of compliance costs that may be imposed on the economy, and to allocate these costs among individual regulatory agencies. A regulatory budget provides for a strict accounting of the costs of newly proposed regulation.

The regulatory budget program will take three to five years from the time of enabling legislation to make all agencies accountable. That is not too long when we remember it has taken years to create the regulatory overload and to tilt the scales against economic progress.

Only when a regulatory budget is in place can there be social and economic balance. And only with a regulatory budget can we achieve our dual objectives: a healthy environment and a healthy economy.

GOVERNMENT REGULATION:
Achieving Social and Economic Balance

I

INTRODUCTION

At the root of America's past success in achieving its social objectives -- including those nurtured by regulation -- was the comfort of dividing the growing national pie provided by a robust economy.

Near the close of the 1960's, the vision of potential economic abundance was based on a seemingly endless supply of cheap energy and a limitless ability to absorb the innovations pouring forth from the Nation's industrial base.

Then came the 1970's.

Even as productive capacities diminished under the influences of a new economic world, social goals continued and even expanded, prompting increased debate about the priorities of a nation -- debate which encompassed the role of government regulation. At the two extremes of the dispute are those who favor a return to unregulated industrial expansion without concern for environmental consequences, and those who support no-growth policies as their way of enriching the overall quality of the environment.

However, no such vision of a ravaged environment clouds the view of this study's consideration of economic and social balance. Nor are the study findings in accord with the attainment of social objectives through the containment of economic progress. Rather, the study is guided by the recognition that the expansion of productive capacity is the foundation for achieving the goals embraced by American society. At the same time, the study acknowledges without reservation the benefits of much government regulation at the National, State and local levels -- benefits in terms of employment creation, environmental protection, improved safety, and regulation of fair trade practices.

Recognized also is the fact that significant benefits do not remove government's need to better understand and to consider the cost implications of regulatory policies. Neither does it remove the necessity to approach policies with the intent to encourage efficient, cost-effective results.

Equally important in the quest for balance is the need to erase the perception that there exists in regulatory activity an endemic conflict between social and economic goals. This dichotomy is false because social demands (including environmental) often have economic consequences.

In a fundamental sense, economics focuses on the question of how resources can be allocated so as to improve the wealth and welfare of a nation. A concern of this study, then, is with the most efficient and effective means of contributing to the present and future wealth and welfare of America.

Another concern is that there be a clear understanding of the role of Congress in the growth of regulatory activity. Increased government regulation in recent decades didn't just happen by chance. The Federal Government derives its authority to regulate from the Constitution, which grants Congress the power to regulate interstate commerce. While Congress in practice delegates authority for regulating to other agencies of government, this transfer of authority does not change the original power of Congress to regulate. Congress, therefore, is the appropriate forum for determining how much authority is delegated, and under what conditions.

By the same token, the responsibility for flaws in the regulatory system also lies ultimately with Congress, and it is in Congress that corrective action must be taken. Common flaws may be delegations of authority with insufficient guidelines, or with guidelines that are perhaps too strict. The courts have given Congress very wide latitude in delegating its authority, which empasizes all the more the responsibility of Congress for initiating regulatory reform.

The motives behind regulation have been important and well-intentioned. Moreover, regulation has sometimes had fortuitous side effects. For example, the enforcement of gasoline mileage standards has to some extent mitigated the competitive impact of fuel-efficient foreign automobiles. Despite this example of government decisions being ahead of those in the marketplace, government has too often failed to recognize the full significance of its actions. In the current inflationary environment there is growing concern that the Federal Government fails to consider adequately the costs of regulatory initiatives.

Several measures have been proposed to reform the system of government regulation and as attempts to better understand and assess the costs of regulation as a budgetary consideration. In general terms, these measures stress mitigating the unintended consequences of government regulation; managing perceived conflicts among national goals and the regulations themselves; encouraging business, labor and government cooperation; coordinating growth opportunities; and encouraging economic growth through new investment.

A key test of the desirability of these legislative proposals should be whether they reduce costs without reducing or adversely affecting the ability of regulatory agencies to carry out their congressional mandates.

To this end, the study turns to an examination of the evidence of the effects of government regulation on growth and investment.

The presentation is in the form of (1) a summary of findings and themes emerging from the Special Study; (2) an analysis of the direct compliance and long-term cost effects of regulation on U.S. economic performance; and (3) the advancement of options for the reform of government regulation.

II

THE SPECIAL STUDY: SUMMARY OF FINDINGS AND EMERGING THEMES

Most contributed papers in the government regulation area document numerous unanticipated consequences, and usually higher costs, resulting from regulatory activities and government mandates.

A disturbing revelation is that the Federal share of GNP is grossly underestimated because regulatory compliance costs are not taken into account. A finding of the study is that:

- In 1976, the conventionally calculated Federal share of GNP was 21 percent. However, regulatory compliance costs -- estimated at $66 billion that year -- were not included in the GNP share calculation. Had they been, the Federal share of GNP would have been 23.5 percent.

- In 1979, the Federal share of GNP as usually determined was again 21 percent. Had compliance costs, estimated at $98 billion, been included, the Federal share of GNP would have been 25 percent.

Should the growth of government regulation continue, the Federal share of GNP -- including compliance costs -- in 1990 could reach about 31 percent; and by 2000 could reach more than 38 percent.*

Several other important, general themes emerge from the study:

(1) The regulated share of the economy has expanded from about one-tenth of Gross National Product (GNP) in 1965 to about one-fourth in 1979. In constant dollar terms this means that, in 1965, $93 billion worth of goods and services were produced under varying degrees of regulation. By 1979, the total had risen to $358 billion. This regulatory expansion carries profound implications for the ability of the economy to adjust to changing economic circumstances.

---

*These estimates and projections are based on the 1976 compliance cost estimates by Murray Weidenbaum, and his subsequent calculations of 1979 compliance costs.

"Regulation", as it is defined here, does not include subsidies and the array of Federal initiatives involving nuclear safety, food and drug regulation, meat inspection, agricultural marketing and maritime regulations.* Had these activities been included: (1) The data would indicate that, in 1965, more than 10 percent of GNP was produced under varying degrees of regulation; (2) the 1979 data would show that more than 25 percent of GNP was directly affected by regulation; and (3) the growth rate of Federal regulatory activity between 1965 and 1979 would have been reduced.

(2) During the 1970's -- at a time when the United States economy was stagnating -- government regulation experienced its greatest growth.

(3) If current regulatory trends were to continue, direct administrative costs of Federal regulatory agencies could grow from $6 billion in 1980 to $11.5 billion in 1990 and $16 billion in 2000. (Figures are unadjusted for inflation).

(4) State regulators frequently duplicate Federal regulatory efforts in the following areas: Agriculture, banking, consumer protection, energy, environment, equal employment and human rights, food and drugs, labor relations, occupational health and safety, air and water pollution control, public utility regulation, and securities regulation.

(5) The small business sector bears a disproportionate share of the total regulatory burden. Unlike large enterprises, small firms cannot easily pass on regulatory costs to consumers. More seriously, regulatory overload may be inhibiting risk-taking and the formation of new businesses.

---

* The regulated share of the economy is understood to include those industries subject to price regulation, as well as those industries most subject to environmental, health and safety regulation. The industries subject to price regulation include utilities, transportation, and petroleum production, refining and marketing. The industries most subject to environmental, health and safety regulation include mining, construction, chemicals, paper, primary metals, petroleum refining, motor vehicles, and stone, clay and glass. The effect of environmental, health and safety regulation is to force producers to take account of environmental and other costs that they do not normally consider. Such regulations generally increase producer costs. Situations calling for policies designed to reduce producer costs are not conventionally treated under the general rubric of "regulation" and are therefore not treated here.

(6) Regulatory initiatives sometimes have quite unintended effects. For example, enforcement of toxic waste regulations has resulted in the collection of toxic wastes prior to their release into the environment. Yet, the problem of the disposal of the accumulated wastes has been associated with the growth of illegal dumping activities. There is, in short, some evidence that government regulatory initiatives have been accompanied by an expansion of unrecorded and unreported business activity. The size of the so-called underground or cash economy is estimated by various studies at from 4 to 10 percent of GNP. The untaxed income generated by this sector, estimated at $177 billion in 1977, increased to $275 billion by 1979 -- a growth of more than 55 percent in two years. Untaxed income in 1979 stood at roughly 14 percent of national income.

(7) While government regulation traditionally focused on economic -- price and entry and natural monopoly -- regulation, environmental and health and safety regulation has become increasingly important. Although the goals of social regulation are generally regarded as desirable, the existing regulatory system lacks the incentives to consider adequately the non-administrative costs of Federal regulation. Although some recent efforts have been made to bring about a better accounting of costs, too many regulators still do not assess the full costs of regulatory compliance, with these results:

(a) The implications of regulatory initiatives are never fully explored in advance. For example, one of the unintended consequences of energy regulation is that it has contributed to increased U.S. dependence upon foreign crude oil. (In 1973, the United States imported 37 percent of the petroleum products it consumed. By 1979, almost 50 percent of the petroleum products consumed was imported.)

(b) There is at present no government-wide statute to assure that the costs of regulation are not underestimated.

(c) The extent of regulation is probably greater than it would be if decisionmakers were held accountable for all the resources claimed by regulation.

(8) In addition to consideration of perceived benefits, there is need for a set of regulatory checks and balances, a system for making choices among competing, sometimes conflicting regulatory goals. Such a system would consist of three elements:

(a) Estimated compliance costs for each proposed regulatory initiative which would take the form of estimated compliance costs.

(b) A limit on the total estimated compliance costs that may be imposed on the economy.

(c) Ongoing development and improvement of the techniques used to estimate compliance (and indirect) costs.

These regulatory checks and balances are the key components of a regulatory budget, a proposal which is outlined in the recommendations section of this paper, and is defined as follows:

A regulatory budget would set absolute limits for a given time period on the compliance costs that the executive branch of the Federal Government could impose, through regulation, on the private sector or on all governmental units.

Compliance costs refer to the increase in expenditures necessary to bring products or procedures into line with the requirements of Federal regulations.

Regulation refers to rules, orders or directives from executive agencies that are intended to direct or alter specific economic or social, or non-Federal Government decisions and actions.

As envisioned, the regulatory budget would require that Congress establish the total amount of compliance costs that may be imposed on the economy, as well as allocate these costs among individual regulatory agencies. It would force a strict accounting of the resource costs associated with proposed regulatory initiatives, and would enable Congress to make trade-offs among regulatory goals, each of which would involve the expenditure of scarce resources. Under a *phase in* regulatory budget program, it would take three to five years to make all agencies accountable.

III

THE EFFECTS OF GOVERNMENT REGULATION

A. Product Prices, Output and Investment in the Regulated Industries.

Federal Government regulation influences the direction, quantity and quality of America's economic growth. Because it affects both the demand for and the supply of goods and services, regulation has an important impact on what is produced, how it is produced, and for whom it is produced. The effects of regulation are pervasive; they are also enduring. Precisely because it affects both product demand and costs of production, regulation is an important determinant of the Nation's productive capacity and its ability to compete in international markets.

Where plant and equipment are fixed -- that is, where industries are equipped for particular energy sources and specific materials -- regulation almost always pushes up costs and reduces the amount of goods supplied at any price. In the best of economic times, regulation would cause price increases on those goods. But at a time when industry and business must pay more for energy and materials, or convert equipment to alternate sources and at the same time meet regulatory requirements on new equipment and plant operations, regulation exacerbates an already bad situation.

Confronted with massive cost increases -- caused by energy, materials and wage rate acceleration, in addition to the costs of regulation -- producers either cut back on plans for expansion of production or actually reduce production below past levels. This results in fewer goods at higher prices and a loss of real income for consumers. While this scenario has been evident across industry lines, it has been most evident in the regulated industries, as shown in Table 1.

There is no evidence which establishes the extent to which regulation itself is responsible for either the increase in prices or the decrease in production. However, there is the following comparison from the special study:

In the five-year period prior to the 1973 oil embargo, prices in the most heavily regulated industries increased more than 30 percent. In comparison prices in unregulated manufacturing increased only 14 percent. Over the same five-year period, production in the most heavily regulated industries increased 8 percent, whereas production in unregulated manufacturing increased 13.5 percent.

During the 1973-77 period, the rates of change almost converged. There is less than a one percentage point difference between the 8.8 percent annual rate of price change in the most regulated industries and the 7.9 percent average change in unregulated manufacturing. The staff study determined, however, that this convergence is misleading because the recession of 1974-75 intervened, making any interpretation tenuous. The recession reduced demand for most goods, but particularly for those goods produced in the most regulated sectors of the economy. As a result, the recession's effect on the demand for these products dampened the rate of price increase in the regulated (and other) industries. It

TABLE 1. Price and Production Changes in the Industries Subject to Environmental and Health and Safety Regulation

Price Changes	1958-69	1969-73	1973-77
	Average annual rates of price change (percent)		
Most Regulated (includes mining, construction, paper chemicals, stone, clay and glass; and primary metals)	7.2	6.6	8.8
Unregulated Manufacturing (total manufacturing with the exception of the most regulated industries and automobile manufacturing)	1.3	2.8	7.9
Production Changes	1958-69	1969-73	1973-77
	Average annual rate of production change (percent)		
Most Regulated	4.6	1.6	-0.7
Unregulated Manufacturing	5.4	2.7	0.6

was because of this, coupled with the massive increase in the price of energy, that the staff study was prompted to decide that interpretation of the 1973-77 price and output data is more than usually ambiguous.

Regulation's impact on the economy is not, however, limited to prices and output of goods produced with existing equipment. More importantly -- especially to the long-run growth and vitality of the economy -- regulation influences decisions by industry to invest in new and more productive plant and equipment.

There are occasions when investment mandated by regulatory goals encourages production. To the extent that equipment which contributes to production is installed, productivity is enhanced and some of the upward pressure on production costs (and prices) is dissipated. Frequently, however, regulation impedes investment. Therefore, the role of regulation in determining the type and the amount of investment is critical. It is a role that cannot be fully appreciated until the costs of regulation are more closely examined.

B. Regulation's Costs and Benefits

The following discussion focuses on costs of regulation. While the benefits of regulation should not be overlooked, there is no *scientifically correct* way to measure these benefits. For example, while some argue that health and safety and environmental regulations do not significantly improve the quality of life, this is a matter of judgment.

For purposes of this study, the benefits of environmental, health and safety regulation are taken to be self-evident, although not quantifiable. Judgments are believed best left for Congress. A March 25, 1980, study prepared for the Committee on Governmental Affairs, U.S. Senate, by the Center for Policy Alternatives at MIT, stated: "The philosophical and ethical issues raised by placing economic values on such intangibles as human life, chronic disease, injury, and pain and suffering will continue to limit the ability of analysts to perform benefits studies without unavoidably making value judgments that are more properly performed by publicly accountable decisionmakers or by the society at large. Due to those various limitations, a strict cost- benefit approach in Federal regulation does not appear advisable."

The cost-effective approach of the regulatory budget is in accord with that appraisal.

In releasing the MIT report, the Governmental Affairs Committee said billions of dollars a year are saved as a direct result of regulation in the areas of health, safety and environment. The major findings on benefits included:

- Air pollution benefits ranging from $5 to $58 billion annually, with automobile pollution controls alone worth $2.5 to $10 billion each year.
- Up to 60,000 lost workday accidents and 350 deaths avoided in 1974 and 1975 due to OSHA rules on workplace safety -- thus reducing the $15 billion society pays annually for industrial accidents.
- Crib safety standards reducing injuries to infants by 44 percent since 1974, and flammable sleepwear standards causing a 20 percent reduction in the frequency of burn deaths and serious burns to children in 1975.
- Automobile safety controls saving over 28,000 lives in an eight year period, 1966-1974. Seat belts alone are said to have reduced injuries by 34 percent and deaths by 20 percent.
- Water pollution abatement resulting in a $9 billion gain to the economy through increased recreational use such as boating, camping, fishing and vacationing.

The cost-effective approach will find no quarrel with the perceived benefits nor goals of regulation. The approach will, however, require that efficiency be maximized and costs minimized.

Therefore -- regardless of the stated goals of regulation -- once it is decided that a particular goal is worth pursuing, it is reasonable and prudent to require that it be achieved in the least costly but most effective way. For this reason, regulatory costs must be understood. An appreciation of the nature of these costs is not fundamentally anti-regulatory; it is merely prudent. It is, moreover, the essential first step in the formulation of a regulatory budget, the regulatory counterpart of the fiscal budget.

The costs of regulation include: (1) Direct administrative costs; (2) compliance costs; and (3) indirect costs.

(1) Direct Administrative Costs

These are the visible Federal budget costs borne directly by taxpayers. Administrative costs are absorbed in the operation of the 56 regulatory agencies involved in economic and social regulation. In 1980, the direct operating costs of these agencies will amount to about $6 billion, a four-fold increase over 1970. About four-fifths of these regulatory outlays are currently devoted to the newer areas of social regulation such as job safety, health and the environment.

(2) Compliance Costs

These are the costs, discussed earlier, borne by those businesses and other organizations which must comply with regulations. Although compliance costs vary among regulatory agencies -- and while a few agencies account for the lion's share -- one fact is universal: Compliance with Federal directives usually imposes capital and operating costs on affected industries. Businesses, in turn, must either pass these cost increases on to consumers through higher prices, or lower their profits. In the case of price increases, consumers bear the direct cost of industry compliance. In the case of profit reductions, they pay an indirect cost. Reduced profits mean reduced retained earnings with which businesses could finance additional investment. Decisions to forgo productivity-enhancing investments mean that *future* costs increase.

Regulatory compliance costs can therefore be interpreted as a hidden tax on consumers and on the economy. It is this hidden tax which the regulatory budget process is designed to help minimize. The hidden tax on consumers grows right along with the compliance costs to industries. The potential for continued growth of the hidden tax is demonstrated by the fact that the compliance costs solely in all industries for environmental regulations only will increase (in 1972 dollars) from $19 billion in 1977 to $52 billion by 1986. Over the decade of the eighties, the costs of complying with Federal environmental regulation will be approximately $360 billion in 1972 dollars. (Weidenbaum's 1979 estimate of regulatory costs was in 1979 dollars.)

During the past decade and a half, the Federal Government has increasingly relied on regulation of the private sector to channel resources toward such public goals as a cleaner environment, safer workplaces, less hazardous consumer products, and equal employment opportunities. Many government regulations -- particularly those affecting health, safety and the environment -- contribute significantly to the overall well-being of the vast majority of American consumers and workers. And while we would not turn back the clock on many regulatory policies which produce substantial benefits, the cost of regulatory programs should be brought under control. This does not contemplate imposing restrictions on the activities of the regulatory agencies. Requiring regulators to do their jobs efficiently is not the same as restricting regulator activities.

Federal paperwork requirements impose significant compliance costs. Businesses allocate about 69 million hours annually to respond to more than 2,100 reporting and recordkeeping requirements according to the General Accounting Office. Yet these costs are clearly underestimates because they do not include opportunity costs, the costs of output foregone because of manhours allocated to Federal paperwork.

Federal paperwork is particularly burdensome for smaller businesses. Small businesses file over 305 million Federal forms a year, totalling over 850 million pages and containing over 7.3 billion questions. The average annual cost to each small business is estimated to be about $1,270, a total cost of more than $17 billion.

The $17 billion figure is large, but it measures only the direct costs of paperwork compliance. Small business typically lacks the manpower and the specialized skills to respond quickly and efficiently to federal data requests. Too often the time of the owner-operator is spent on paperwork at the expense of a careful monitoring of other activities essential to the survival and growth of the small enterprise.

There have been other attempts to quantify regulatory compliance costs. A recent update of a report prepared for the Joint Economic Committee by Dr. Murray Weidenbaum of the Center for the Study of American Business estimated the total costs of complying with Federal regulations at $98 billion for 1979.

A 1979 study conducted by Arthur Andersen & Company for the Business Roundtable looks at the direct, incremental costs incurred by 48 companies in complying with six Federal regulatory areas in 1977 -- the Environmental Protection Agency (EPA), Equal Employment Opportunity (EEO), the Occupational Safety and Health Administration (OSHA), the Department of Energy (DOE), the Employee Retirement Income Security Act (ERISA), and certain activities of the Federal Trade Commission (FTC). The study defines incremental costs as the direct costs of those actions taken to comply with a regulation that would not have been taken in the absence of that regulation. For the 48 firms surveyed, these costs amounted to approximately $2.6 billion, with manufacturing companies most heavily affected. The study finds that EPA regulations are the most costly to business, although compliance costs vary widely among industries.*

Some of the most serious regulatory costs involve the failure to reconcile sometimes conflicting national objectives. For example, EPA regulations encourage the increased use of foreign oil, particularly the low-sulfur variety. EPA regulations also make it difficult to obtain permits to expand domestic production capacity, while price control regulations make refinery investment unattractive. As a result, imports of foreign oil are encouraged, and additional strains placed on the U.S. balance of payments. To illustrate the kinds of anomalies that have resulted, EPA and DOE regulations were responsible for cutting back heavy oil production from the fields of the City of Long Beach, California by nearly one-third between 1974 and 1977.

(3) The Indirect Costs of Regulation

Indirect costs are the longer term effects on private sector behavior resulting from the absorption of the compliance costs. The effect of regulation on the level and composition of private investment is perhaps the most serious indirect cost. This is because any diversion of investment dollars satisfying regulatory requirements generally means diverting dollars away from investment in more productive plants and equipment. The result is often a reduction in the rate of output growth and an increase in prices. Reduced output growth and higher prices, therefore, must be deliberately balanced against the benefits of cleaner air, safer work places and other regulatory goals.

While the displacement of productive investment is one of the most important indirect costs of regulation, it is only part of the investment story. Regulation has affected both the character and the rate of growth of the Nation's capital stock; a rate of growth which has been reduced because of regulation's effect on rates of return on investment. This effect is most prominent in the industries that are subject to price regulation. Industries not under price regulation are better able to respond to current market conditions and adjust to current changes in production costs and consumer demand.

*Compliance with federal regulations does result in a demand for such things as environmental control devices. The construction and installation of such devices, of course, results in the employment of labor and the generation of income.

For example, public utilities must convince regulatory agencies of the need for price increases long after their costs of operation have increased. This is because regulatory bodies have traditionally required justification of price increases based on historical costs. When costs are relatively stable, this process may not cause severe hardships on the price-regulated industries. However, when costs are rising rapidly, price adjustments lag behind costs and profit margins shrink.

Price adjustments based on current market conditions allow investors to realize competitive rates of return on investment. But when profit margins are reduced because cost increases cannot be offset with price increases, rates of return decline. This in turn erodes investor confidence in the ability of those industries to generate competitive yields on investments.

Once again, the problem of balancing conflicting goals emerges; the benefits of controlling price-regulated industries must be balanced against the costs of foregone investment in those industries. The balancing problem is difficult, but not intractable. Whether the conflicting goals are lower energy prices vs. continuing energy dependence, or lower cost refined copper vs. cleaner air, a systematic procedure for choosing among alternatives is required. The regulatory budget provides such a procedure and gives Congress the mechanism for determining how much of the Nation's resources will be devoted to the full spectrum of regulatory compliance costs, as well as the amount to be allocated to specific areas of the economy.

Not only would the regulatory budget provide a procedure for the reconciliation of competing, sometimes conflicting, regulatory goals; it would also focus attention on the so-called adjustment problem.

(4) Regulation and the Adjustment Problem

United States producers compete in a changing world in which experience is only a tentative guide. In this increasingly competitive global economy:

- Energy is more expensive and its sources are less secure.
- The price of manufactured goods has fallen relative to the price of raw materials from which they are derived.

- **The U.S. competitive position has been eroded by sluggish investment, declining rates of productivity growth, and increased technological sophistication of U.S. trading partners.**
- **Foreign producers are increasingly subsidized by their national governments.**
- **The less developed countries seek systematically to substitute domestic goods for imports.**

If U.S. producers are to survive and to prosper, they must *adjust* to this rapidly changing environment. Government regulation has a positive role to play in this adjustment process. But it is a role that cannot be played properly if regulatory policies are implemented on a piecemeal basis. Policymakers should take account of the total costs of regulatory initiatives. An explicit accounting of compliance costs would go a long way toward facilitating choice among regulatory goals in a tougher, more competitive world.

Productivity-enhancing investment is essential to the growth and vitality of the U.S. economy. The regulatory budget can facilitate rather than impede adjustment. Under the aegis of a regulatory budget, the tolerable levels of compliance costs would, in part, be determined by changing conditions. So, too, would the regulatory price tags. As experience accumulates, the compliance cost estimates would, inevitably, take fuller account of the previously discussed indirect costs. In effect, the regulatory budget would focus attention on the competitive position of specific U.S. industries. The regulatory budget process will generate information that will be useful in determining the appropriate private and governmental responses to changing market conditions.

Regulatory reform initiatives should be a part of a development-oriented strategy to stimulate investment and revitalize the industrial base of the Nation. A "strategic growth policy" is needed, a comprehensive policy concerned with the interrelated sectoral impacts on industrial development of monetary, fiscal, spatial and regulatory policies.

The regulatory budget would become a linchpin of the adjustment process; a mechanism for taking account of the full implications of regulatory initiatives for the growth and vitality of U.S. industry.

(5) Small Business, Risk-Taking, and Regulation

Small business is the largest employer in the United States.* The Nation's 13.7 million small business entrepreneurs create 66 percent of all new jobs. Moreover, small businesses generate 24 times as many innovations per research dollar as do the largest companies. By any standard, small business is a catalyst to economic growth. As such, it should be nurtured rather than encumbered. The role of regulation, therefore, is particularly important in the context of the small business.

The average small entrepreneur works 58 hours a week in his or her business. Any time devoted to regulatory compliance necessarily means less time available for product development, production, marketing, and other common entrepreneurial functions. Unlike larger companies with structured information systems, smaller concerns do not enjoy the luxuries of separate accounting, finance and other divisions which can share the burdens of regulatory compliance. It comes as no surprise, therefore, that government regulation may actually be inhibiting the formation of new business enterprises. Because of the important role of small business both in employment and innovation, this could prove to be the most serious of the indirect effects of regulation.

While some of the regulatory problems are unique to small business, others are shared with large businesses. A common problem revolves around the conflicting incentives of regulators and entrepreneurs. The nub of the problem is the regulators' preceived responsibility to establish *objective* standards by which *their* performance in achieving regulatory goals can be measured. It is this quest for objectivity that largely explains the regulators' penchant for design standards as opposed to performance standards; a preference for rigidity rather than flexibility in the promulgation and administration of regulations. It is, after all, easier to determine and to demonstrate compliance when rigorous design standards are imposed; design standards that often do not take account of differing technical and market conditions.

---

*The figure for the number of small businesses is based upon Internal Revenue Service tax information, and employs the following definitions of small business: Manufacturing enterprises with 500 or fewer employees; retail and service establishments with annual sales of $2 million or less; wholesale firms with annual sales of $9.5 million or less; general construction enterprises with sales of $12 million or less, and specialty trade construction firms with sales of $5 million or less.

In effect, the regulators' demand for predictability and control becomes a constraint on the adaptability and the growth of business. It also becomes a constraint on risk-taking, the essence of the entrepreneurial function.

The efficient achievement of regulatory goals -- whether cleaner air, a safer work place, or a more fuel-efficient car -- would be better served if regulators were guided by different incentives. While some efforts have begun by agencies to consider costs other than administrative, at present the performance of most regulators is all too often primarily judged against standards that take no account of compliance costs. But it is precisely the compliance costs and the attendant indirect costs that ultimately determine the efficacy of regulatory initiatives. The focus of regulators and Congress should be on the cost effective achievement of regulatory objectives.

A central concern is the accountability of regulators for the resources claimed by regulation, whether calculated as total compliance costs or as the costs imposed by any one agency. This is the primary rationale for the regulatory budget.

IV

POLICY RECOMMENDATIONS

A strict accounting of compliance costs is the missing link in the regulatory process. A regulatory budget would provide the mechanism for limiting total compliance costs and thereby help Congress better assess competing social goals. It would also give regulators a clear mandate to seek cost-effective implementation.

The process of accounting for compliance costs would require all parties concerned to consider the context in which regulations are promulgated and administered. A very important part of the regulatory context is the adjustment problem which dictates that American industry respond to the changing conditions of a more competitive global economy.

Just as industry must adjust and better prepare itself to compete in a changing world, so must the regulatory bodies adjust. As experience with the regulatory budget accumulates, more of the indirect costs of compliance will be apparent to regulation agencies. The result will be greater understanding of the effects of regulation and of the changing atmosphere in which U.S. industry operates.

It is in this sense that the regulatory budget can be, first, a learning tool, and then a management tool, not only of the regulatory process, but of the adjustment process as well. The acquisition and dissemination of knowledge gained in the regulatory process will result in a better understanding of the changing fortunes of American enterprise -- and of the role played by regulation, both here and abroad. With private and public responses based on more comprehensive information, the probability of success will be enhanced.

RECOMMENDATIONS

1. To Encourage Cost-Effective Regulatory Initiatives and to Speed the Adjustment Process:

a. Congress should pass legislation establishing a regulatory budget.

The regulatory budget should be phased in. From the time of enabling legislation, it would take about three to five years to bring all regualtory agencies under the aegis of the regulatory budget. A limited number of regulatory agencies would be initially affected. This would enable the Congress, the regulatory agencies, and the affected industries to identify problems and, in general, to perfect the process prior to its broader adoption. Of particular interest is the evolution of the scope of, and the methods employed in, the estimation of the costs of regulations. As experience is gained, the quality of the regulatory budget as a management tool will be enhanced.

b. For price regulated industries, such as public utilities, permissible rates of return should be based on current rather than historical costs.

c. Environmental, health and safety regulation should be implemented on the basis of performance rather than design standards.

2. To Assist in the Identification of Cost-Effective Means of Implementing Regulatory Goals:

a. In those instances in which a consensus among regulators, industry, and the public as to the efficacy of regulatory standards does not emerge, provision should be made for Congressional review. In general, emphasis should be placed on achieving compliance through consultation rather than through legal action.

b. The compliance cost estimates contemplated by the regulatory budget should, so far as is possible, take account of the associated indirect costs. At a minimum, clearly formulated productivity impact studies should be undertaken before new regulations are promulgated.

c. In the interest of minimizing compliance costs, the reporting requirements of regulatory agencies should be coordinated, and the number of overlapping jurisdictions should be reduced.

3. To Discourage the Growth of Unrecorded Business Activity and at the Same Time to Increase Productivity, Saving and Investment:

Tax rates on both earned and unearned income should be reduced. Reductions in tax rates need not result in reduced tax revenues because:

(a) monies that heretofore escaped taxation will be taxed, and

(b) to the extent that saving and investment are encouraged, productivity will increase and income will grow faster.

GOVERNMENT REGULATION: ACHIEVING SOCIAL AND ECONOMIC BALANCE

INDEX NARRATIVE

The Government regulation volume is, perhaps, the broadest of all areas investigated in the Special Study on Economic Change. The various contributed papers, while covering a wide range of policies and programs, are by no means exhaustive of the subject. The aim is to explore the nature of change and develop creative policy options for Congress. The papers are presented in three sections:

Section 1 -- "Government Regulation: Trends and Changes." The section documents the growth of regulatory activity and analyzes the cumulative impact of regulation on a broad range of national policy concerns.

Section 2 -- "Federal Regulation: Industry Performance and Social Goals." This Section assesses the impact of both economic and social regulation on the performance of selected U.S. industries, broadly defined. The papers analyze the regulatory climate in telecommunications, financial institutions, and health care and present alternative approaches for achieving the goals of regulation in these industries. The final paper in this section discusses the impacts of regulation on small businesses.

Section 3 -- "Federal Mandates." This section focuses on the direct and indirect costs that are borne by State and local governments and educational institutions when the Federal Government mandates performance standards. Also considered is the problem of regulatory conflicts which frequently occur when several layers of government impose different standards of performance on private industry.

Section 1 "Government Regulation: Trends and Changes." A paper by Thomas K. McCraw suggests a rationale for the growth in Federal regulatory activity and argues that the increasing complexity of the U.S. political economy, especially as regards economic policymaking, has led to calls for a more activist and interventionist role by government at all levels. The present regulatory situation represents the accumulated legacy of three major periods of regulatory explosion -- the progressive era, the New Deal, and the "social" regulation period since 1960. In general, political and economic forces have combined to produce a system of ad hoc regulation. The pace of new agency and new authority creation may slow, however, due to changing perceptions of the costs, benefits and overall impacts of regulation on overall economic performance in the long run.

Arnold Weber examines the political economy of wage-price policies in the United States since 1946. While the increased vulnerability of the U.S economy to international developments is more likely to increase rather than diminish the appeal of wage-price policies, still, the experience of the past 30 years indicates that the heroic concept of wage-price policies has not been realized. As a reviewer noted, however: "A major past failing has been to view these policies as substitutes for the required fiscal monetary policies and as a basis for ignoring the inflation impact of other government policies."

Ronald Braeutigam in "The Role of Antitrust in a Deregulated Environment" finds that whether deregulation is partial or not, the first task of antitrust enforcers will be to determine whether structural change is required to prevent the exercise of unchecked economic power by firms now accountable to regulators. In other words, antitrust enforcement could encounter a number of practices deeply ingrained in regulated industries and antithetical to competitive markets. Deregulation, where significant barriers to entry exist, could be the worst of public policy worlds.

The paper by Anne Witte and Carl Simon estimates the size of the "underground" GNP at from 3 to 5 percent of reported GNP. In terms of size, the most prominent underground sector is the non-reporting of legal income. In terms of growth in recent years, the employee theft portion of the stolen goods economy is the most dynamic. Yet, as a peer reviewer notes: "It is important that Congress not get locked into a debate over the exact numbers detailing the extent of the underground economy. We should be concentrating on, from a policy standpoint, to what extent the various government agencies should try to address this problem and how they should do it."

Mira Wilkins attempts to raise general issues with respect to the U.S. competitive position and argues that foreign government policies have profound implications for the U.S. economy. In an interdependent economic world, the rise of protectionism could be counter productive.

Arthur Wright, Christopher DeMuth, Richard Shackson, and Eric Stork consider how a Regulatory Budget would work. The authors found constitutional barriers that would exclude the so-called independent regulatory commissions from a regulatory budget system -- unless Congress passed appropriate legislation. In their words, "...the independence of the so-called independent regulatory commissions is a matter of congressional determination rather than constitutional requirement." Thus, "if the Congress elected to establish a regulatory budget system, it could give the President the legal authority to require full adherence to the constraints of such a system." The organization and management of a regulatory budget system could be similar to that currently utilized for the fiscal budget.

Section 2 "Federal Regulation: Industry Peformance and Social Goals." Paul MacAvoy and Dorothy Tella focus on the impact of government-economic and social regulation on the performance of U.S. industry. As recently as the mid-1960's, Federal regulatory agencies mainly set prices and determined levels and kinds of service for the public utility, communication and transportation industries. The then regulated sector amounted to nearly one-fourth of GNP. Over the past 15 years, as a rough measure, regulatory growth has increased three times faster than government expenditures. Today, regulation not only extends into new areas, but the older economic regulation is having unintended, often restrictive effects on industry.

Nina Cornell and Douglas Webbink examine the new competition in the telecommunications industry and conclude that in a period of rapid technological change, regulation may act as a barrier to change in an industry and to the entry of new firms. Yet, as a reviewer has noted: "While a logical case for deregulation of telecommunications can be made, it is by no means an open and shut case. . .what is going on now under the aegis of the FCC is a sort of pseudo deregulation in which entry is encouraged but then protected from true competition, at the consumer's expense. This is to me the worst of all possibilities."

Paul Horvitz assesses the impact of regulation of financial institutions on competition and on the allocation of national resources. He argues that a credible system of Federal deposit insurance makes unnecessary much of the regulatory framework aimed at the safety of financial institutions. Some regulation is necessary mainly with respect to capital requirements and to a viable deposit insurance system but restrictions on prices, entry and branching are unnecessary. The author estimates the incremental costs borne by financial institutions in complying with regulations at $500 million to $1 billion annually.

Warren Greenberg examines alternatives to regulation in the health care industry as a means of combatting rising medical costs. (Health care expenditures comprised 9.1 percent of GNP in 1978 and the costs of health care have been increasing at about double the rate of the consumer price index for the rest of the economy.) The paper suggests increased use of copayments and deductibles and indemnity provisions in insurance plans.

William Diamond examines the differential impact of regulation on small business. He reports that data show the disproportionate impact of regulation on the small business sector. State regulators also add to small business costs.

Section 3 "Federal Mandates." Robert Firestine questions whether well-intentioned government regulatory requirements that affect State and local governments are necessary. He reports that State and local governments are increasingly pressed for program documentation, statistical information and other procedural requirements that unnecessarily add to costs. He suggests that some funding be shifted from project grants to other aid instruments as one means of reducing procedural costs.

The Federal-local government relationship during the 1970's has been marked by two parallel developments, claims Thomas Muller: Rapid growth of Federal aid to cities and substantial expansion in the number, scope and type of Federal mandates and other regulations. Compliance with Federal requirements is imposing significant incremental costs on local governments. For the six programs studied, these costs are estimated at over $7 billion.

Carl Kaysen and Crystal Lloyd-Campbell in "Federal Regulation and Higher Education," note that regulatory efforts, particularly with regard to minorities and women, have made a difference; however, they suggest that present regulatory machinery no longer is serving academia well.

Howard Bowen examines the socially imposed costs of higher education -- that is, the growth of higher educational expenditures attributable to new social demands. He concludes that, on the whole, the directives of social programs are laudable but their execution is clumsy. In addition, inadequate attention is being given to financial needs created by socially imposed costs. Bowen estimates that compliance with Federal regulations inflates the cost of operating universities by some $3 billion a year. Perhaps the greatest need is to explore the question of how the legitimate needs of society for security and equality may be reconciled with intellectual freedom and excellence.

Robert B. Hawkins examines Federal regulation in relation to inter-govermental structure by use of a case example. To build a new facility, a chemical company was required to deal with four levels of government and 28 different departments or agencies that required 65 permits for construction. He suggests the development of: A unified State and national statement on what constitutes critical environmental impact information; an acceptable sequence for environmental reports; and permit processing through cooperative Federal-State-regional-location actions based on specific timetables, by industry and by complexity of issues.

Author's Biographical Data

The following are brief biographies of authors of selected papers in the Government Regulation section of the SSEC.

Howard Bowen is the Avery Professor of Economics at Claremont Graduate School. Previously, he served as the Chancellor of the Claremont University Center and the President of the University of Iowa.

Ronald Braeutigam is Assistant Professor of Economics at Northwestern University. He received his Ph.D. in Economics from Stanford University and has since worked for the Federal Government, for private industry, and in academia.

William Diamond is Associate Professor of Marketing at the School of Business and Director of the Regional Advancement Service at the State University of New York at Albany. Professor Diamond's career has been devoted to the problems faced by small businesses in a regulatory environment.

Nina Cornell is chief economist and **Douglas Webbink** is an economist for the Office of Plans and Policy at the Federal Communications Commission. Previously, Cornell was the Senior Economist of the Council on Wage and Price Stability, and a research associate at Brookings Institution.

Robert Firestine is a recognized expert in the field of State-local finance and in the problems of intergovernmental relations. As the co-director of the Syracuse University Educational Finance and Governance Center, he supervised and conducted State-local fiscal analyses of New York State, California, Ohio, Texas, Detroit, and Los Angeles.

Warren Greenberg is currently Senior Research Economist at the Center for Metropolitan Planning and Research of The Johns Hopkins University and has published widely on health care and costs.

Robert Hawkins is president of the Sequoia Institute in Sacremento, Calif. Previously he served as the chairman of the California State Task Force on Local Government Reform and Director of the California State Office of Economic Opportunity.

Paul Horvitz is Professor of Finance at the University of Houston. He has spent his entire career as a professional economist in the banking and securities industry, both in and out of government.

Carl Kaysen and **Crystal Lloyd-Campbell** are serving respectively as the Vice Chairman and Director of Research and Senior Research Staff Member of the Sloan Commission on Government and Higher Education. Carl Kaysen is the David W. Skinner Professor of Political Economy at the Massachusetts Institute of Technology. Crystal Lloyd-Campbell is Associate Professor of Law at Suffolk University Law School.

Thomas McCraw is a professor of business administration at the Harvard Business School. He has written several articles on the subject of government regulations and presently teaches a course on Managing in the Regulated Environment.

Thomas Muller is the Principal Research Associate at the Urban Institute. He received his Ph.D. from American University and has worked for the Institute since 1970 on the issues of fiscal impact, urban growth and decline.

Arnold Weber is now President, University of Colorado, and formerly was Professor of Economics and Provost at the Carnegie-Mellon University. Formerly, he served as Executive Director of the Cost of Living Council and has published widely on the wage-price freeze of 1971 and the ensuing phases of price controls.

Mira Wilkins is Professor of Economics at Florida International University. She received her Ph.D. from Cambridge University (England) and has taught at Smith College, Union College, Columbia University, and the University of Massachusetts.

Anne Witte is Associate Professor of Economics at The University of North Carolina at Chapel Hill. She has extensive experience with developing models of criminal recidivism and of types of criminal activity and is virtually the only economist of national stature who has looked into the economics of crime and the propensity of criminal elements to engage in reported, versus unreported activity.

Arthur Wright is now Chairman of the Department of Economics at the University of Connecticut. Formerly, he was an associate professor at Purdue University. Wright is well known in the economics profession for his interest and achievement in the area of public policy and comparative economic systems. **Christopher Demuth** is Director of the Faculty Project on Regulation and Lecturer at the Kennedy School of Government, Harvard University. He brings to the study a firm grounding in the law and an expertise in government regulation. **Richard Shackson** is Director of the Energy Policy Center of Carnegie Mellon Institute. He is a policy analyst with considerable experience in corporate-government relations. **Eric Stork** is a Visiting Professor of Technology and Public Policy at Purdue University. He has held several Federal regulatory positions, including that of a Deputy Assistant Administrator of the EPA and Deputy Director of the Bureau of Regulatory Compliance at the Food and Drug Administration.

Federal Finance:

Government Dollars and American Affluence

Joint Economic Committee

Special Study on Economic Change

A staff study

November 1980

The Joint Economic Committee's Special Study on Economic Change (SSEC) was inaugurated under the leadership of then Chairman Richard Bolling (D.-Mo.) and Vice Chairman Hubert H. Humphrey (D.-Minn.), together with Senator Jacob K. Javits (R.-N.Y.), ranking Minority Member.

The study progressed through Mr. Bolling's chairmanship and into the leadership of Senator Lloyd Bentsen (D.-Tex.), chairman; and Congressman Clarence J. Brown (R.-Oh.), ranking Minority Member. The goal of the SSEC is to chart the major changes in the economy and to analyze their implications for policymakers.

JOINT ECONOMIC COMMITTEE

LLOYD BENTSEN, Texas, *Chairman*
RICHARD BOLLING, Missouri, *Vice Chairman*

SENATE	*HOUSE OF REPRESENTATIVES*
WILLIAM PROXMIRE, Wisconsin	*HENRY S. REUSS, Wisconsin*
ABRAHAM RIBICOFF, Connecticut	*WILLIAM S. MOORHEAD, Pennsylvania*
EDWARD M. KENNEDY, Massachusetts	*LEE H. HAMILTON, Indiana*
GEORGE McGOVERN, South Dakota	*GILLIS W. LONG, Louisiana*
PAUL S. SARBANES, Maryland	*PARREN J. MITCHELL, Maryland*
JACOB K. JAVITS, New York	*CLARENCE J. BROWN, Ohio*
WILLIAM V. ROTH, Jr, Delaware	*MARGARET M. HECKLER, Massachusetts*
JAMES A. McCLURE, Idaho	*JOHN H. ROUSSELOT, California*
ROGER W. JEPSEN, Iowa	*CHALMERS P. WYLIE, Ohio*

JOHN M. ALBERTINE, Executive Director
LOUIS C. KRAUTHOFF II, *Assistant Director-Director, SSEC*
RICHARD F. KAUFMAN, *Assistant Director-General Counsel*
CHARLES H. BRADFORD, *Minority Counsel*

Table of Contents

CHAIRMAN'S INTRODUCTION i
Rep. Clarence J. Brown
RANKING MINORITY MEMBER'S INTRODUCTION iii
Rep. Clarence J. Brown
I. INTRODUCTION 1
II. ALLOCATION OF NATURAL RESOURCES 3
III. THE PROVISION OF BASIC NECESSITIES 18
IV. THE INTERGOVERNMENTAL SYSTEM 22
V. FEDERAL CREDIT PROGRAMS 29
VI. SUMMARY AND RECOMMENDATIONS 34

CHAIRMAN'S INTRODUCTION

Senator Lloyd Bentsen

Chairman, Joint Economic Committee

Government has become America's biggest business, with 80,000 units of government in the 50 states spending $760 billion a year. That expenditure averages out to $3500 annually for every man, woman and child in the United States, making it incumbent on all areas of government to provide a dollar's worth of efficiency for every dollar spent.

Government at all levels has the responsibility to remove programs which cause duplications, waste and extravagance -- especially the Federal Government, which is the subject of this staff study from the Special Study on Economic Change.

Policymakers need to concentrate on eliminating the frills and on measures which maximize production in public and private workplaces. The removal of regulations which unnecessarily burden the economy is a major requirement, because government regulation today takes more than $100 billion annually out of America's economy.

Americans for too long have suffered from the ballooning of Federal grants, a subject explored at length in this study. For example, in 1955, Federal grants amounted to $19.30 per person in the United States. Last year, Federal grants averaged $375.80 per American. This stunning growth in Federal payouts is totally unacceptable.

The Federal contribution to State and local governments increasingly has become the target of Congressional alarm. This study finds that direct Federal aid to local governments has climbed from $310 million in 1957 (or $1.80 per person) to $15.5 billion today (or $70.25 per person). This constitutes a 22 percent annual rate of increase and a 16-fold increase in real terms.

Local governments now receive over 75 cents in State and Federal aid for every dollar they raise locally, compared to 60 cents in 1972 and 42 cents in 1957. For many cities, Federal aid is the largest single revenue source.

In connection with the Federal aid to State and local governments, this study rejects the notion that the purpose of Federal aid should be to help equalize regional growth rates. That goal would require such large differences in the distribution of Federal aid as to be economically and politically impossible, and without growth equalization results. The study notes that some states and cities must bring their own spending more in line with national norms. For example, New York State and local governments spend nearly 40 percent above the per capita national average for governments even though per capita personal income in New York is barely 5 percent above the national average.

Similarly, more attention to the growth of Federal loans is needed. Although many Federal loan programs serve necessary purposes -- such as those which provide assistance following disasters caused by hurricanes or tornadoes or drought -- more attention is required to weed out the programs which do not have merit. In the past 25 years, $1.5 trillion have been lent under Federal sponsorship. If every person living today had shared equally in the loans of the past quarter century, each would have borrowed $7,000 through Federal programs. Many government-backed loans are helpful and can be the support lines for new and innovative business and industry which create most of the new jobs in America. Better use and coordination of the worthwhile loan programs could result in more job opportunities in private business.

Possibly the most serious flaw in government's effect on private enterprise is its failure to curb inflation. Exorbitant increases in the cost of living have not only eroded the value of pay increases in America; inflation has pushed wage earners into higher and higher tax brackets which take more and more of the worker's money. For example, a person earning $12,000 in 1963 paid the Federal government 26 cents on the last dollar earned that year. In 1979, that same wage earner needed to make $28,000 just to keep pace with inflation. Meanwhile, however, the Federal government was taking 37 cents of the worker's last dollar earned in 1979. Such work disincentives must be eliminated.

This study clearly portrays the path America must take. Policies which take less from employers and employees, coupled with programs to stimulate economic growth and raise productivity, will create a better atmosphere for private enterprise.

Ranking Minority Member's Introduction

CONGRESSMAN CLARENCE J. BROWN

The chief message to policymakers which is contained in this important report is that this country faces a major problem in resolving Federal budget priorities over the next decade.

The reasons for this are two-fold: The relentless climb in the Federal budget has been crowding out the possibility of other initiatives such as increased defense spending and sufficient tax reductions for individuals and business; sluggish economic growth has impaired this country's ability to finance increasingly expensive government programs while maintaining desired rates of capital investment.

Twenty-five years ago Federal transfer payments were less than 20 percent of the budget. Now they comprise over 40 percent and are still climbing. Examples of such transfer payments are Social Security outlays, and outlays for Civil Service and military retirement. Because such programs are funded by "open-ended" appropriations, they are outlays which budget planners call "relatively uncontrollable." Other areas where the budget is driven by increases in relatively uncontrollable spending are medical care, housing assistance and food/nutrition assistance. Although the President's budget for fiscal year 1981 projects that the share of relatively uncontrollable spending as a percent of outlays will level off in the near future, this is unlikely and would amount to a reversal of past trends.

This is the context in which this nation must make up for deficiencies in other Federal programs, in particular national defense.

Another important finding of this staff study is that the budget crunch has its counterpart on the GNP side. We face a "production crunch" caused by the fact that our appetite for Federal programs and a rising standard of living is running up against our ability to produce. We all know that sluggish economic growth causes unemployment and does not appear in recent years to have helped make much headway against inflation. What is also painfully apparent is that sluggish growth chips away at our standard of living. What this means in practical terms is that increased incomes, instead of being translated into more purchasing power, get translated instead into higher prices. Under the circumstances, it is no surprise that Americans are finding it increasingly difficult to finance the purchase of a new home, a new car, or even a restaurant meal.

The staff study recognized that policies for renewed economic growth are the key to resolving the budget crunch and the production crunch. These policies must be carefully administered, since the traditional economic policy tools for increasing production (more Federal spending and generalized tax cuts) are likely to make the inflation problem even worse. Consequently, the report advises that supply side oriented tax cuts be accompanied by reductions in the growth of Federal spending; this will promote capital formation and economic growth without increasing inflationary expectations.

These are policies which have been recommended in some circles for several years. Indeed, had the supply side tax cuts now being proposed by Republicans and Democrats alike been enacted earlier, we might not find ourselves in the situation which currently grips us. As I point out elsewhere in the SSEC, we would have been able to afford a balanced budget and major increase in all Federal spending programs, plus dramatic real increases in disposable personal incomes, if this country had grown at the rate of our industrial competitors since 1950. In other words, there is a direct connection between economic growth and this country's ability to pay for the costs of government.

The third area where this staff study has an important message for policymakers is the area of rapidly expanding domestic assistance programs. Income maintenance programs, grants-in-aid to State and local governments, and Federal credit activities have all grown rapidly in the past decade and already form a system of unnecessary complexity and inefficiency. This study recommends a comprehensive approach to reordering the structure of Federal domestic assistance programs. I believe that substantial budget savings can be made through such a comprehensive approach without harming the beneficiaries of the programs themselves. The same productivity gains which policymakers expect in the business sector should be the goals of government as well.

As a new administration takes office and this country enters a new decade, political leaders will have to take a sober look at the constraints which currently govern Federal spending. This staff study places the problem in a perspective which will contribute substantially to a practical resolution of these important issues.

Contents of Volume

The following is a list of titles and authors of papers which will appear in the final printed volume of the Federal Finance section.

Section 1 -- Long-Term Shifts in U.S. Resource Allocation

1. Post-War Trends in the Uses of the National Output -- A GNP Budget Approach (Frank C. Ripley, Consultant)
2. Trends in the U.S. Federal Budget, 1947-48 (Ronald L. Teigen, University of Michigan)

Section 2 -- Changes in Federal Finance: A Macroeconomic Approach

1. Changes in the Financing of the Federal Debt and Their Impact on the U.S. Economy, 1948-80 (Carl F. Christ, John Hopkins University)
2. Stabilization Policy in the Open Economy (Rudiger Dornbusch, Massachusetts Institute of Technology)
3. State and Local Budgets, Urban Budgets, and Federal Macroeconomic Policies (Edward M. Gramlich, University of Michigan)

Section 3 -- Changes in Federal Finance: A Programmatic Approach

1. Income Transfer Programs in the United States: An Analysis of Their Structure and Impacts (Sheldon Danziger, University of Wisconsin; Robert Haveman, University of Wisconsin; Robert Plotnick, Dartmouth College)
2. Trends in Social Welfare Spending: Factors That Will Shape the Future (Robert Harris, Urban Institute)
3. The Role of Intergovernmental Grants in the U.S. Economy With Special Attention to Countercyclical Policy (Wallace E. Oates, University of Maryland)
4. Federal Credit Programs (George Aragon, Boston College)

Section 4 -- Selected Issues in Federal Taxation

1. Inflation and the Federal Income Tax (George F. Break, University of California, Berkeley)
2. Income Taxation and Labor Supply (Harvey S. Rosen, Princeton University)

Special Study on Economic Change

LOUIS C. KRAUTHOFF, II, *Director*
GEORGE D. KRUMBHAAR, JR., *General Counsel*
BILL R. MADDOX, *Editor*

FEDERAL FINANCE:

Government Dollars and American Affluence

Prepared under the direction of:

GEORGE D. KRUMBHAAR, JR.
General Counsel

FEDERAL FINANCE:

Government Dollars and American Affluence

I

INTRODUCTION

Compared with a quarter of a century ago, the orientation of the U.S. economy has shifted, permitting greater spending on health, education and consumer goods. This has gone hand in hand with a steady rise in national affluence and a fundamental change in emphasis in Federal spending from defense to social welfare programs. One result is that Americans are able to clothe and feed themselves on proportionately less of their income than they needed 25 years ago. By contrast, they have proportionately more left over for discretionary spending.

For a variety of reasons, the trends which have characterized America's affluence over the last quarter-century have already slowed down and could possibly reverse themselves. Even appropriate government policies aimed at better growth and higher productivity (which have, admittedly, long-term benefits) are not likely to improve the economy rapidly. This means that short-term Federal policy must recognize the present period as one of adjustment to new economic circumstances while programs are devised and enacted to restore a strong economy. It also means that over the next few years this country will experience extreme difficulty reconciling the goals of a strong defense, adequate energy supplies, more purchasing power for consumers, and a fair system of social welfare.

This staff study discusses the workings of these and other important developments in that part of the economy included under the rubric of Federal Finance, and discusses the policy implications of these changes in light of the commonly recognized observation that difficult choices lie ahead.

The Federal budget can be analyzed in a number of ways. For the purpose of this study it is broken down into four categories:

- The Federal budget and the allocation of national resources.
- The Federal budget and income maintenance — the provision of basic necessities to Americans.
- Federal finance and the State-local sector.
- Federal credit activities.

Each of these topics represents an area where either the *composition* of the Federal activity has changed significantly (e.g., from defense, to social welfare spending) or where Federal activity has grown rapidly (e.g., Federal income maintenance programs grew approximately 430 percent during the 1970's). As such, they pose issues appropriate to the SSEC, whose function is to examine fundamental changes occurring in the U.S. economy and point out their implications for policymakers. Before analyzing each in turn, however, another theme must be noted which is implicit throughout this staff study: The characteristics of the Federal budget, such as its size and priorities, are the result of political as well as economic exigencies. In fact, the economic policy of a democracy like the United States is heavily influenced by the political process. Thus, the ability of government to carry out spending programs is limited by popular perceptions about how big government should be and how heavily it should be involved in certain activities. These perceptions are a political "fact of life" of some importance and color the debate on how economic policy should proceed.

A final section of this study discusses some policy options for meliorating national economic growth, meeting the needs of different regions of the country, and improving the institutional framework for making economic policy.

II

THE ALLOCATION OF NATIONAL RESOURCES

Americans presently live in an economy that reflects complex historical processes, both here and abroad, favoring U.S. dominance in the world economy and a steady rise in Americans' ability to consume. U.S. political stability created a good investment climate. Abundant and cheap energy was available, and favorable terms of trade existed until the last decade. All these factors helped to sustain the position of the United States as the wealthiest country in history.

The following sub-sections describe how this economic performance and resulting affluence has affected — and has been affected by — the way this country utilizes its resources.

Spending

Table 1 illustrates, through the use of a "GNP Budget," one method of looking at how Americans have changed the way they use their resources. By describing major sectors of the economy in terms of a percentage of the gross national product (GNP), it illustrates roughly the proportional amount that each sector claims from the Nation's ability to produce. For example, basic necessities (defined here as food, clothing and the maintenance of housing), which in 1955 claimed almost 45 percent of output, now claim only about 35 percent. The following additional facts also appear in Table I.

- *Defense spending* has fallen as a percentage of GNP and now claims less than 5 percent of output when only direct spending for defense purposes (i.e., excluding military retirement payments) is taken into account.
- *Education and manpower spending* has grown as a percentage of GNP. Growth in education spending has come about partly from the need to educate "baby boom" children and partly from the changes in Federal education policy that resulted in the Elementary and Secondary Education Act, the Higher Education Act and Federal programs for the handicapped. Growth in manpower spending is due primarily to the increase in outlays for public service employment, which commenced in 1971 and comprised 35 percent of government outlays for training and employment services in fiscal year 1979.
- *Health spending* in the U.S. economy has claimed a larger percentage of the country's resources as affluence, rising medical costs, and the passage of Medicare and Medicaid have

TABLE I

Percentage Distribution of GNP in Current Prices, by Function

(Figures may not add because of rounding)

	1955	1966	1969	1973	1977
Total GNP	100.0	100.0	100.0	100.0	100.0
Basic necessities	44.7	38.0	37.0	35.3	35.5
Defense	9.3	7.9	8.1	5.6	4.9
Education and Manpower	4.3	6.4	7.1	7.6	7.8
Health	4.6	5.9	6.6	7.4	8.5
General Government	2.2	2.8	3.1	3.5	3.9
Transportation	11.5	11.3	11.3	11.4	11.7
New housing	6.0	4.0	4.2	5.2	5.0
Business investment	11.1	12.7	11.6	11.8	10.9
Net exports	.6	.7	.2	.5	-.6
Discretionary consumer spending, plus miscellaneous	5.9	10.3	10.9	11.6	12.4

Sources: Frank C. Ripley, "Post War Trends in the Uses of the National Output -- A GNP Budget Approach," Special Study on Economic Change, 1980.

Note: These functional components of GNP were derived from the National Income and Product Accounts, and are detailed in Ripley cited above. The following general explanations are derived from the Appendix to that study:

Basic Necessities: include food, clothing and the maintenance of housing; also utilities, furniture, domestic service and toilet articles.

Education and Manpower: includes private education and research, public education, government manpower programs and certain veterans' benefits/services.

Health: includes private medical expenditures, plus government health programs such as medicaid, medicare, veterans' medical benefits/services, Social Security and special welfare services.

Transportation: includes auto purchases and service, gasoline/oil, public transportation expenditures, tolls, net insurance premiums, government transportation outlays.

General Government: includes Federal, State and local expenditures for central administration, civilian safety, natural resources management, utilities/sanitation and certain veterans' benefits/services.

Defense: includes military services, foreign military assistance, National Guard.

New Housing: includes fixed residential investment, urban renewal, community facilities and public housing.

Discretionary Consumer Spending, plus miscellaneous: includes chiefly consumer spending for other than basic necessities.

diverted resources into medical care. Some economists argue that affluence — which made possible wide-spread private health insurance — and the passage of Medicare/Medicaid are responsible for a large amount of the above-average inflation in medical costs.

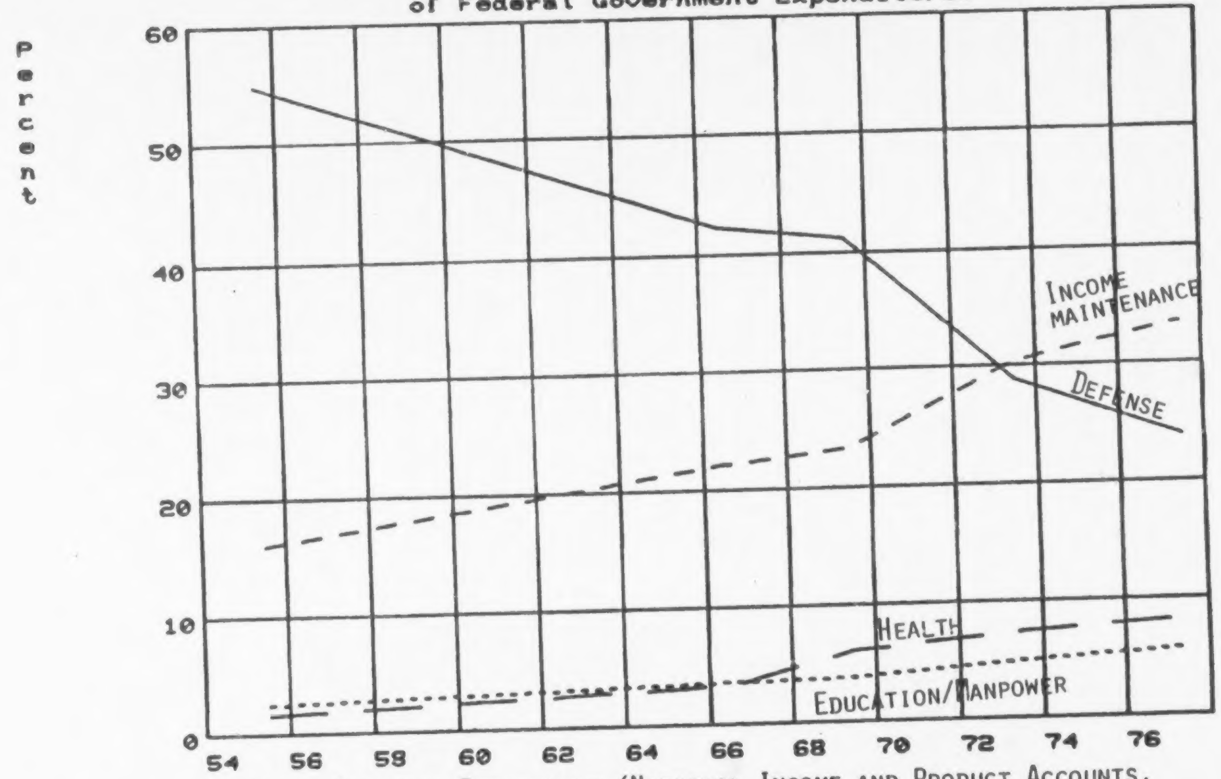
- The percentage of output the United States has devoted to the administration of government has climbed steadily (due to a rise in spending for State and local government administration).
- Transportation and new housing have remained relatively constant as a percent of GNP.
- Business investment is slightly lower than it was in 1955, and significantly lower than it was in 1966. To raise the 1977 share to the share which existed in 1966 would require $32.4 billion in additional investment.
- Net exports (i.e., exports of goods and services, excluding military transfers, minus imports) have dropped substantially in the last 25 years, and remain a relatively small proportion of GNP.
- The category of discretionary consumer spending, which includes chiefly purchases such as entertainment, recreation, and consumer durable goods, has more than doubled as a percent of GNP in the past 25 years and now claims approximately 12.5 percent of output.
- The increase in the proportion of America's output devoted to education/manpower, health and discretionary consumer activities has been "financed" by the smaller proportion that this country has devoted to direct defense spending and the provision of basic necessities.

Some of the trends that show up in a GNP analysis are reflected in the Federal budget. Chart 1 shows the resulting trends in Federal Government expenditures.

The budget share devoted to defense spending, for example, shows a decline from 54.8 percent of Federal spending in 1955 to 23.2 percent in 1978. Health spending climbs by 5.4 percentage points after 1966, when Medicare and Medicaid were enacted. The amount of the percentage increase in income maintenance — which includes Supplemental Security Income (SSI), Social Security, Civil Service pensions and food stamps, and corresponds roughly to the "basic necessities" classification in the previous table — illustrates how the priorities in the Federal budget have changed as this country has converted more of its tax revenues into income maintenance programs. Such programs now exceed the amount spent on defense and comprise 32.6 percent of outlays.

CHART 1.

Percentage Distribution of Selected Major Types of Federal Government Expenditures



SOURCE: COMMERCE DEPARTMENT (NATIONAL INCOME AND PRODUCT ACCOUNTS. TABLE 3.14)

Another way of looking at the Federal budget is through a breakdown by types of Federal financial activity. Such a breakdown is shown in Chart 2. It illustrates the extent to which the Federal Government has become involved in the business of transferring income among income classes and to other levels of government, and less involved as a final buyer of goods and services. In 1974, direct Federal Government purchases of goods and services fell below the level of Federal transfer payments to individuals. Purchases of goods and services, which amounted to 65.3 percent of the Federal budget in 1955, now total less than 35 percent. Transfers, on the other hand, have climbed from 18.2 percent of the budget to more than 40 percent.

Chart 2 also illustrates how grants to State and local governments have climbed both absolutely and as a proportion of the Federal budget. These grants, while still climbing in dollar terms, have declined slightly as a percentage of total Federal expenditures since 1977, after rising steadily before then. They now take up 16.1 percent of Federal budget outlays, compared with 4.5 percent in 1955.

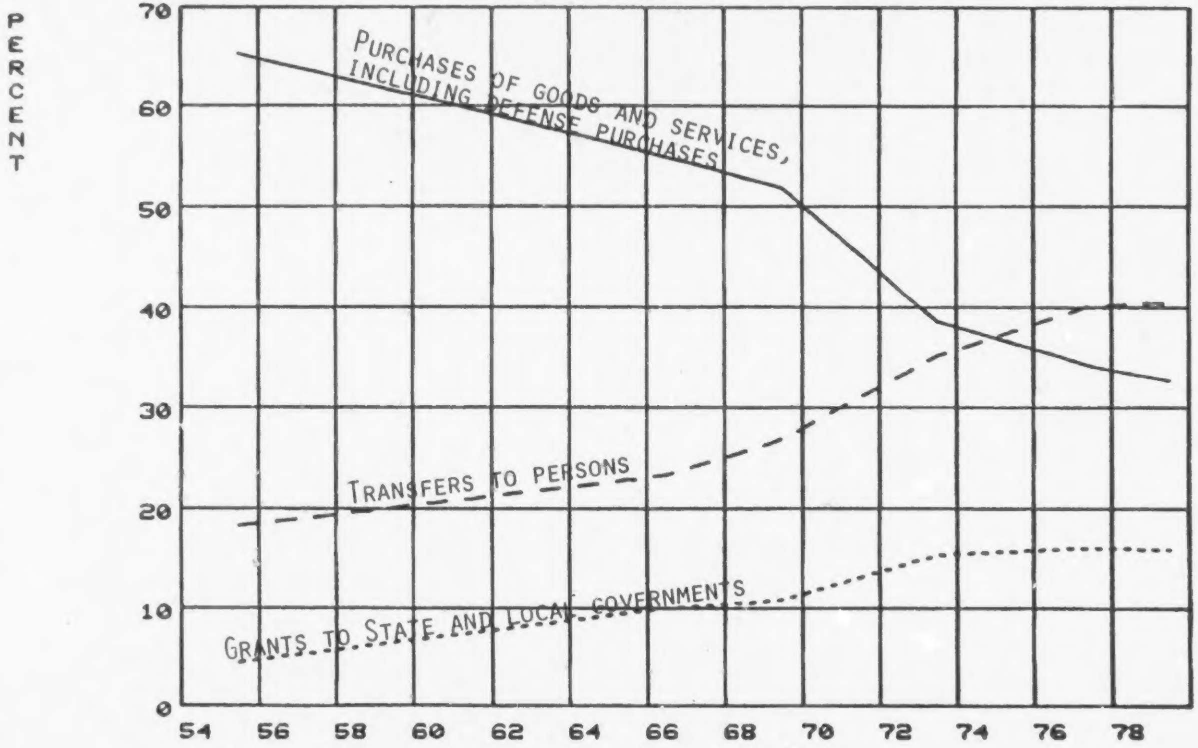
One of the studies written for the SSEC* attempts to isolate long-term secular trends in the Federal Budget from cyclical factors, significant price-indexing or inflationary effects, and one-time events (e.g., major legislation such as the tax reductions of 1964) that influence the budget figures. The study concludes that a large part of the Federal budget is affected by an underlying set of social, economic and other factors which exerts a continuing and systematic influence on the budget's composition and size. Decisions to index Social Security payments to the inflation rate, to enact a comprehensive medical assistance plan for the aged, and to make secondary and higher education available to a larger proportion of the population are examples of such factors.

Together with other government programs, and seen in a non-economic context, they are aspects of America's modern political history. However, they have also had a significant economic effect by helping to change the emphasis that the Federal government has placed on different categories of spending. The most strongly affected categories are non-defense purchases, such as office equipment and Civil Service salaries, transfer payments and grants-in-aid to State and local governments (which are climbing as a percent of outlays) and defense purchases (which have been falling). In other words, the long-term trends which are apparent from a conventional examination of budget figures also show up when these

---

* Ronald Teigen, "Trends in the U.S. Federal Budget, 1947-1978" (August 1979).

CHART 2.
COMPOSITION OF SELECTED MAJOR FEDERAL GOVERNMENT ACTIVITIES



SOURCE: ECONOMIC REPORT OF THE PRESIDENT 1980.

figures are adjusted to compensate for such occurrences as business cycle fluctuations and one-time events.

Controllability of Budget Outlays

These long-term trends, as depicted in Chart 2, raise the issue of controllability of Federal outlays. If the upward trends are relatively uncontrollable, Federal policy may be hampered in an attempt to adjust to the new economic conditions of the 1980's.

The conventional definition of relatively uncontrollable outlays * encompasses those which are required by contact, existing law or other obligations. The former category is considered to be relatively uncontrollable only in the short run, since contracts have termination dates. The latter two categories, therefore, are the more important for an analysis of relatively uncontrollable spending. These categories, consisting chiefly of open-ended or entitlement programs, and fixed costs such as interest, comprised 35 percent of Federal spending in 1967 but will rise to an estimated 59 percent in FY 1981.

In this regard, it is worth noting that the unified budget outlay categories that show the strongest trend growth over the past quarter-century are those driven by expenditures labelled as relatively uncontrollable. Among these are Social Security and railroad retirement, Federal employee retirement, Medicare and Medicaid, and housing assistance for individuals. These categories, which accounted for $33.9 billion, or 21.3 percent in Federal outlays in FY 1967, covered $182.5 billion or 37.0 percent of all Federal outlays in FY 1979. ** This amounts to a compound annual growth over that period of 15.1 percent. More significantly, these categories have climbed as a percent of unified budget outlays by an average of 1.3 percentage points per year.

Together with outlays from prior year contracts, relatively uncontrollable outlays will account for approximately 76 percent of spending in FY 1981. The President's budget indicates that uncontrollables are likely to continue at this share in the near future. If this should be the case, it would mark a departure from the trend of growth in uncontrollable spending categories described in the above paragraph.

---

* Strictly speaking, these categories are not completely uncontrollable, since Congress can theoretically amend or repeal the legislation giving rise to the expenditures. They are called "relatively uncontrollable" in Federal budget terminology because existing law mandates such outlays and because amendment or repeal is considered unlikely. Some examples are Social Security, unemployment compensation, and interest on the Federal debt.

** Source: Budget of the U.S. Government, FY 1981.

An appreciation of these budget trends is important in any effort to control the overall level of government spending. This is because continued pressure from relatively uncontrollable spending, coupled with the generally acknowledged need to spend more in such areas as defense and energy, could increase government spending to unacceptable levels.

Just what constitutes an unacceptable level of government spending? Theoretically, at least there is no optimum level above which spending would be unacceptable. Other countries have higher levels of government spending relative to national output. What is relevant for the purposes of this staff study is that government purchases of goods and services represent a claim on national output, which might otherwise be claimed by a private sector activity. In addition, total government spending (i.e. purchases of goods and services plus such items as grants- in-aid and transfer payments) roughly represent the measure of government's interference with private sector decisions on how to allocate their own resources. To use an analogy: If the government raises money from a would-be home purchaser so that a poorer person can own a home instead, this does not change the level or the composition of economic activity within the GNP as a whole, but it does change the command which various classes of individuals have over their own resources. Coupled with information on the distribution of the tax burden, which is examined below, the level of Federal and of

TABLE II

Government Spending as a Percentage of GNP During Five Recovery Periods*

Years	Federal	State, Local	Federal, State, Local
1954-57	17.8%	8.5%	25.5%
1958-60	19.0	9.8	26.6
1961-69	19.5	11.2	28.5
1971-73	20.6	13.9	31.0
1975-79	22.2	14.5	31.8

Source: Adapted from *Economic Report of the President*, January 1980.

* Federal grants-in-aid to state and local governments are reflected in both Federal and State/local expenditures, as in Appendix B of the Economic Report of the President. Total government spending is adjusted to eliminate the double counting of Federal grants-in-aid.

government spending relative to national output is a valid indicator of how much control Americans have given, or are willing to give, to their government.

In this context, what constitutes an acceptable level of Federal spending is as much a political judgment as an economic one. This study notes, however, that both Federal and all government spending relative to the economy have been rising gradually over the past quarter century. Table II on page 10 compares Federal and all government spending in the economy during each of the five recovery periods since the recession of 1953-54. Although these recovery periods vary in duration, they are comparable for the purposes of analyzing levels of government spending.

The above analysis is not intended to imply that Federal claims on the Nation's output of goods and services have increased unduly. The above figures incorporate all Federal (or, respectively, Federal, State and local) activity including transfer payments. Federal purchases of goods and services actually declined over the five recovery periods analyzed. And the goods and services purchased by all levels of government have fluctuated irregularly around 20 percent. The figures are as follows:

TABLE III

Purchases of Goods and Services as a Percentage of GNP During Five Recovery Periods

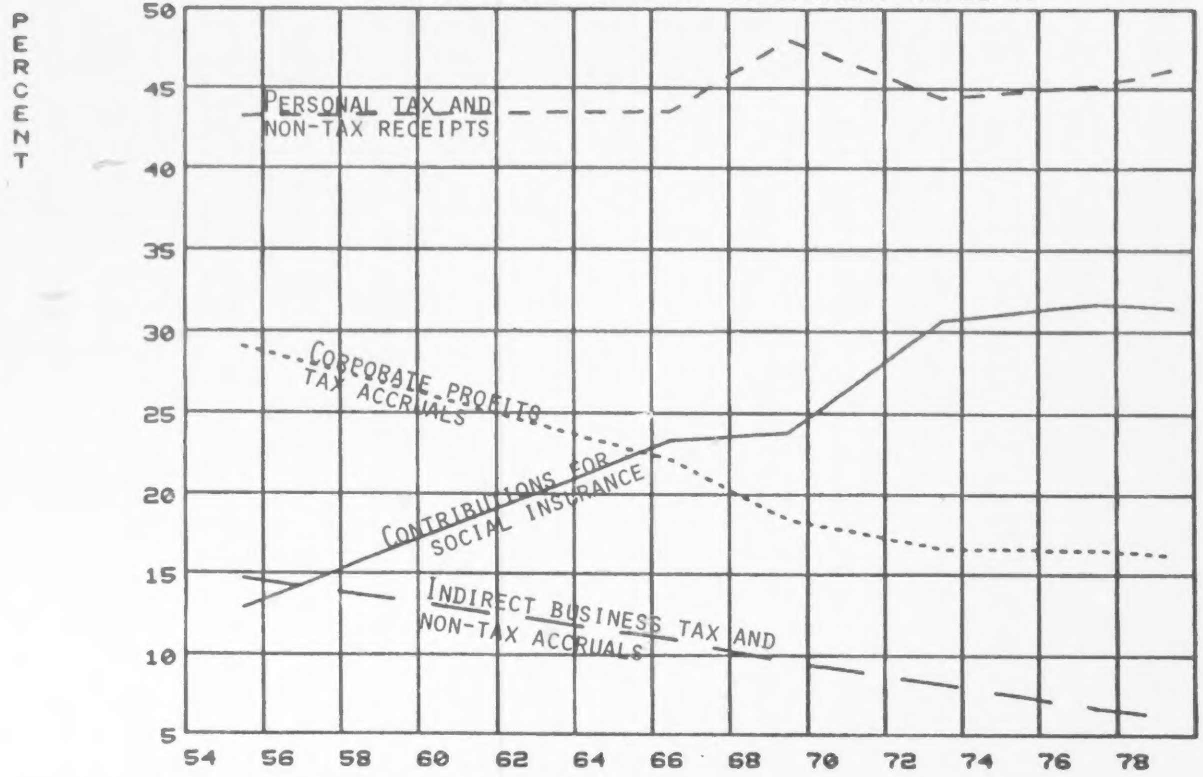
Years	Federal	State, Local	Federal, State, Local
1954-57	11.7%	7.8%	19.5%
1958-60	11.2	9.1	20.3
1961-69	10.7	10.5	21.2
1971-73	8.5	12.9	21.4
1975-79	7.5	15.5	21.0

What this table also shows is the relative shift of the federal government away from a purchaser of goods and services and toward a government which dispenses grants-in-aid and transfer payments.

Tax Revenues

The composition of Federal tax receipts has also changed over the past 25 years, paralleling changes taking place in outlays. Chart 3 indicates these changes, which show up primarily in the areas of contributions for social insurance, corporate profits taxes, and

CHART 3.
COMPOSITION OF FEDERAL GOVERNMENT RECEIPTS



SOURCE: ECONOMIC REPORT OF THE PRESDIENT 1980, P. 289.
TOTALS MAY NOT ADD BECAUSE OF ROUNDING.

indirect business tax and non-tax accruals (e.g., alcohol and tobacco taxes, customs duties paid by corporations, etc.). What these figures indicate is that social insurance receipts -- a blanket term used to describe Social Security taxes, unemployment insurance, Federal employees' retirement contributions, etc. -- have become an increasingly important source of government revenue, just as outlays for basic necessities have become a larger proportion of Federal government spending. In fact, the increase in social insurance receipts closely matches the increase in Federal outlays for basic necessities. Over the same period of time, corporate profits taxes and indirect business taxes have come to be relied upon proportionately less.

There has also been an irregular, though small, upward trend in total Federal tax receipts as a percentage of GNP. Federal tax revenues, which stood at 18.2 percent of GNP during the 1954-57 recovery period, were an average 19.9 percent during the most recent recovery. The following table compares federal, and all government revenues as a percentage of GNP over the past five recovery periods:

TABLE IV

Government Receipts as a Percentage of GNP During Five Recovery Periods

Years	Federal Government Receipts	Own Source State, Local Government Receipts	All Government Receipts
1954-57	18.2%	7.3%	25.5%
1958-60	18.3	8.3	26.6
1961-69	19.1	9.5	28.6
1971-73	19.3	11.8	31.1
1975-79	19.9	11.9	31.8

Source: Adapted from *Economic Report of the President*, January 1980.

* State and local government receipts are defined in this table to be those derived from those governments' own revenue sources -- i.e., excluding Federal grants-in-aid.

---

* State and local government receipts are defined in this table to be those derived from those governments' own revenue sources -- i.e., exluding Federal grants-in-aid.

Has the burden of taxation shifted over time? There are several ways of looking at this issue. In testimony before the SSEC, evidence was presented comparing 1963 marginal tax rates with 1979 rates on the same real level of taxable income. That evidence suggested that almost all taxpayers pay significantly higher marginal tax rates today (that is, higher tax rates on one's last dollar of income) than they did in the early 1960's. For example, persons in the $20,000-$24,000 bracket now corresponds to an income of approximately $47,000-$56,500 today. Yet the marginal tax rate for people earning that much is 49 percent.

Marginal tax rates are a useful indicator of the burden of earning an additional dollar. However, they are less useful in assessing the average tax that each income class pays. Moreover, other tax law provisions such as itemized deductions distort the picture one might get from looking at the tax tables alone. More detailed studies have looked at the overall structure of individual income taxation, to include these other factors. One such recent study concludes that the Revenue Act of 1978 departed from a tendency in previous legislation toward greater progressivity in the income tax burden.*

A more comprehensive way of looking at the tax burden is to calculate which income classes ultimately bear the burden of corporate, property, sales, and payroll taxes, as well as individual income taxes. Unfortunately, the only authoritative studies following this approach do not cover recent years. However, they find little change in the pattern of taxation over the one period which has been extensively documented -- 1966-70.

The purpose of this discusssion -- ascertaining how large the tax burden is, and who bears it -- is to fill out one's understanding of how Americans have been affected by trends in Federal finance. For example, the pattern of Federal spending over the last quarter-century suggests that recipients of income maintenance programs, i.e., the poor, have been the primary beneficiaries of long-term budget trends. But the picture is incomplete without examining who has paid for these programs.

From the tax analysis point of view, it is difficult to produce hard data on which income classes bear how much of the cost of running the government. This is because of the complexities of technique and interpretation described above. What is certain, however, is that government's receipts have increased as a percentage of GNP. The evidence also implies that inflation has increased the marginal tax rates of all but the very rich and the very poor; and that the progressivity of individual income taxes may have slowed down slightly in the last couple of years.

---

* Benjamin A. Okner, "Distributional Aspects of Tax Reform During the Past 15 Years," National Tax Journal, Vol. 32, No. 1, March 1979.

What these conclusions show is that the increases in overall spending discussed earlier are not being "financed" by particular income classes. Rather, the burden of additional Federal spending is being borne by virtually everybody.

Federal Influence on National Output

Many different forces influence the composition of the national output. A large Federal initiative could theoretically displace some private or State and local sector spending, or it could actually attract additional spending into an area perceived to be heavily supported by Federal expenditures. Surveys of the effect of Medicare and Medicaid indicate that both these phenomena have influenced spending in the health field. In other words, the connection between Federal initiatives and the allocation of national resources is sometimes contradictory and is at any rate subject to varying interpretations.

Studies produced for the SSEC also indicate an interesting correlation between shifts in Federal priorities as seen in the grants-in-aid system and shifts in the priorities of the recipient State and local governments themselves. The largest increases in State and local government spending have taken place in those areas where Federal grants-in-aid have also increased by the largest amount. Thus, State and local spending on basic necessities increased almost $40 billion during the 1955-77 period, while Federal grants-in-aid for basic necessities increased by $29 billion. Education and manpower outlays also posted large increases, in both State/local spending and Federal grants-in-aid. Changes in the *composition* of State and local government spending, however, have not always matched changes in the composition of Federal grants. Between 1973 and 1977, for example, Federal grants for education and manpower increased from less than one-fifth to more than one-quarter of total grants; State/local spending for education and manpower remained the same, relative to total State/local spending.

Analysts draw several conclusions from the above general observations, some of which are treated in detail in the SSEC study of State and local government finance. For the purposes of a discussion of Federal influence on national output, the observations underscore the finding that there is some slippage in the State/local response to Federal spending initiatives, even if there has been a marked similarity of priorities with regard to social welfare spending at all levels of government.

Ultimately the effectiveness of Federal policy will be judged not on some theory of how it influences output, but on how well such national goals as a strong defense system, the elimination of poverty, or a minimum standard of health care for all Americans are met. The "GNP Budget" method of analysis is useful for describing how much production has been going to meet goals which compete for their share of national output. As this country enters a new decade, the competition among national priorities will run up against the economy's ability to satisfy these varied claims on its output.

Claims on Future Output

The "GNP Budget" approach is also useful for analyzing claims on future output. By looking at the GNP as a whole, policymakers can take account of the problems that a stagflation economy will encounter in mustering the resources to meet the national goals of the 1980's. To the extent that the post-war economy was aided by declining real energy costs, a favorable movement in terms of international trade, and high productivity growth rates, it now suffers correspondingly. The rapid rise in petroleum prices was a key element in the deterioration on balance in terms of trade throughout the 1970's. This, coupled with the onset of substantially lower productivity growth rates, raises serious doubts about whether the trends that have characterized U.S. affluence over the last 25 years will continue. The downward trend in the share of output allocated to the purchase of basic necessities has leveled off in more recent years. The share of resources devoted to discretionary activities has leveled off from its upward trend.

The evidence suggests that the same economic forces are likely to affect America's future as well. One projection prepared for the SSEC, using basically the same assumptions about inflation and output as those in the 1980 Report of the Council of Economic Advisors, also indicates that by 1985 there will be a falloff in the proportion of national output available for personal consumption spending or business investment. The same study also concludes that significantly higher Federal spending -- such as would take place through Federalization of welfare, higher real defense spending, a national health insurance program and major government investments in energy or transportation -- would further impede the economy's ability to accommodate these private sector claims.

What is at work here is a simple fact of economic life: Over the long term, any nation can satisfy additional demands on its output only by producing additional goods and services. Over a shorter period, an excess of competing claims can theoretically show up in the form of inflation, balance-of-payments deficits, or -- if the excess claims caused by government -- hidden or legislated tax increases. Recent history indicates that the United States has taken all three courses.

If this country chooses to fund marked real increase in defense spending, an ambitious energy program, a system of national health insurance and a Federal welfare program -- to list four commonly cited national priorities -- plus marked increases in the level of business investment, dramatic changes might well be seen in the way the national product is allocated. This is because consumption at present rates could crowd out the claims on future output implied by a high investment/other national priorities scenario. To accomplish these other objectives, ordinary consumption must decline.

Conclusions

These findings have considerable relevance for the flexibility of budget policy. This is because potentially slower growth rates in the economy, and pressures for a reversal of the previous downward defense spending trends, will clash head-on with the need to maintain adequate rates of growth in other forms of Federal outlays. The findings also suggest that policymakers have little choice but to concentrate first on measures to maximize production -- with all that this implies for the rapid achievement of some social policy goals.

In a concluding section, this staff study considers policy options to promote the levels of saving and additions to productive capacity required over the coming decade to satisfy claims on future output.

III

THE PROVISION OF BASIC NECESSITIES

The introduction to this staff study points out that post-war affluence has financed the growth of discretionary activities while at the same time enabling Americans to produce enough for their basic wants with successively smaller proportions of their output. One aspect of this affluence is that the Nation has been able to provide basic necessities in a more systematic way to a larger proportion of the population. This involves more than simply "welfare," as the term is commonly understood. It has occurred through such programs as Social Security, public employee retirement, unemployment insurance payments and veterans' income support. These income maintenance programs have increased steadily, especially during the late 1960's and 1970's, with the enactment of new programs and with the liberalization of existing benefits and eligibility requirements. History will undoubtedly record that the increased affluence of the post-World War II period led citizens to revise upward their notions of what constitutes a minimally decent level of income, and also increased their ability to transfer resources to those at the lower end of the income scale.

Reducing Poverty

The conventional method of measuring poverty takes as its starting point the cash income needed to sustain a family on a so-called "economy food plan." Under that definition, the poverty level for a non-farm family of four was calculated at $3,022 in 1960 and an estimated $7,410 in 1979.

The conventional definition of poverty and the poverty rate are based on before-tax cash income, which includes such transfer programs as Social Security, SSI, unemployment compensation and welfare income. Under this "post-transfer" concept of income, the size of the poverty population dropped more than 15 million persons between 1959, when records were first made, and 1979. The poverty rate -- that is, the ratio of the poverty population to the U.S. population as a whole -- was cut approximately in half, as seen in Table V, page 19.

Official statistics have not yet been fully developed to indicate the effect which income transfer programs have had on reducing poverty; as stated above, the official statistics refer generally to post-transfer cash income. Figures developed for the SSEC, however, attempt to detail what the poverty rate might have been without the existence of transfer programs. The poverty rates under this "pre-transfer" concept of income are seen in Table VI below:

	TABLE V		TABLE VI	
Year	"Post-Transfer" Poverty Rate (Conventional Definition)	Millions of People	"Pre-transfer" Poverty Rate	Millions of People
1960	22.2%	40.1		
1965	17.3	33.6	21.3%	41.4
1970	12.6	25.9	18.8	38.5
1976	11.8	25.4	21.0	45.2
1978	11.4	24.9	20.2	44.2

If one accepts the pre-transfer income concept, it is possible to conclude -- by comparing pre- and post-transfer poverty rates for 1978 -- that almost 20 million persons who would otherwise be poor are now living above the poverty level because of income transfer programs.

In a limited one-year survey, the Census Bureau has found that approximately 14.5 million persons were brought out of poverty by Social Security, SSI and public assistance programs in 1978. That finding is consistent with the 20 million figure above, since the Census Bureau did not include the effects of unemployment insurance, workmen's compensation, or veterans' and government employee pensions.

The above analysis lends itself to the following conclusions about income transfer programs and poverty reduction:

- Federal income transfer programs have made substantial headway in reducing the incidence of poverty. Without the existence of such programs, between 14.5 and 20 million persons would otherwise be poor, representing 6.9 to 9.2 percent of the population.*

---

* Neither poverty measure cited above accounts for other, in-kind benefits such as food stamps and Medicaid. Obviously such benefits, if they could be measured accurately, would lower the poverty rate further. One such measurement, which adjusted income according to the three largest in-kind programs -- food stamps, Medicare and Medicaid -- and also according to certain technical factors such as underreporting, concluded that the poverty rate for 1976 was 6.5 percent.

- Overall, the pre-transfer poverty rate -- which is a rough measurement of how much poverty there would be in the absence of Federal assistance programs -- has not gone down in recent years, partly because economic growth has been less vigorous. Although the incidence of both pre- and post-transfer poverty diminished substantially during the 1960's, it has remained stable or even climbed during the 1970's, depending on which measure one chooses. In absolute terms, using the government's own statistics, there were more poor people in 1978 than in 1969.

Whether the reduction of poverty has been accomplished through increases in earned incomes or through liberalization of income transfer programs, the United States has been able to devote a significant portion of its output to reducing the consequences of poverty, even as Americans generally have been able to spend a smaller proportion of output on basic necessities. Federal income transfer payments have increased at a more rapid rate than other sources of personal income. Today, income transfer programs are a $200 billion enterprise.

Reducing Income Inequality

As might be expected, the Federal transfer system as a whole favors the poor. Even in programs where eligibility does not depend on income level, a large portion of the funds expended go to those who would otherwise be living below the poverty line. More than half of Social Security payments, for example, fall into this category. Over 90 percent of the $7 billion in AFDC outlays finds its way to persons living below the poverty level.

The finding of this staff study is that the existence of transfer programs has had a marked effect in preventing an increase in income inequality. Overall, however, the degree of income inequality has not decreased significantly in the post-war period. In other words, income distribution would have been more unequal but for the existence of the transfer system.

Any discussion of inequality raises questions about the proper extent of government's involvement in equalizing incomes. Gross inequalities of income run counter to America's concept of economic justice; nevertheless, the possibility of earning substantially more than the average is a major factor driving any capitalist system. While it is clear that government bears some responsibility for ensuring that its citizens are clothed, fed, and housed, this responsibility does not necessarily extend to guaranteeing that all after-tax incomes be equalized. Analyses of income distribution are useful, because a trend toward increasingly unequal incomes could be a precursor of social unrest, and may indicate a lack of economic opportunity within society.

Conclusions

National prosperity will continue to be closely linked with the hope of eliminating poverty and reducing income inequality. In the final analysis, however, the ability of any government to make substantial headway against poverty depends upon the willingness of its political leaders and citizens to vote for and support increased funding for anti-poverty programs. This is unlikely to happen at a time like the present, when the outlook for significantly increasing real incomes -- and real discretionary spending -- is slim.

Unless the United States succeeds in further increasing the level of real incomes, this country will not be in a position to make further inroads against poverty except at the expense of other national priorities. If the economy remains stagnant and the growth rate of transfer payments slows over the coming decade, further progress against poverty may be slight. There may even be increases in poverty and income inequality.

IV

THE INTERGOVERNMENTAL SYSTEM

Government has become America's biggest business: 80,000 units of government spend $760 billion annually on efforts to satisfy the financial security, education, health and other needs of 226 million Americans. Although autonomous, these units of government make decisions that affect one another. In the aggregate, they operate as a single system. For this reason, their interrelationships are particularly relevant for Federal policymakers.

Since a separate area of the SSEC is devoted to a detailed study of State and local government finance, no attempt is made here to duplicate that effort. This staff study looks at the following issues from a Federal perspective.

Financial Trends

This study has documented changes in the distribution of the national output and the composition of the Federal budget, with regard to spending in such broad categories as basic necessities, education/manpower, and health. These changes appear as well in the intergovernmental system. The major instruments of such change are the level and characteristics of Federal aid to state and local governments. Intergovernmental aid has almost quadrupled in the last 10 years, with the result that about one-fourth of state and local spending in the last five years can be traced to Federal Government sources, as seen in Table VII, page 23.

Within the intergovernmental system itself, the trend has been toward increased direct Federal aid to local governments and a larger fiscal role for the State governments. Direct, as opposed to pass-through, Federal aid to local governments has climbed from $310 million in 1957 to $15.5 billion today. This constitutes a 22 percent annual rate of increase and a 16-fold increase in real terms. According to the Census Bureau, local governments now receive over 75 cents in State and Federal aid for every dollar they raise locally, compared to 60 cents in 1972 and 42 cents in 1957. For

TABLE VII

Federal Aid to State and Local Governments

Fiscal Year	Amount (Billions)	As a percent of -- GNP	Total Federal Outlays	State-Local Expenditures
1955	3.2	.8	4.7	10.0
1960	7.0	1.3	7.7	14.7
1965	11.0	1.6	9.2	15.3
1970	24.0	2.5	12.2	19.4
1975	49.8	3.6	15.3	22.9
1978	77.9	3.6	17.3	26.4
1979	82.9	3.4	16.8	25.6

Source: Adapted from the Special Analyses of the Budget, 1981, Table H-7, p. 254.

* GNP column calculated in calendar years. Federal Grant-in-Aid figures for calendar years found in the Economic Report of the President, 1980. Table B-73, p. 289.

many cities, Federal aid constitutes their largest single revenue source.

Patterns of revenues and expenditures reinforce this picture of an intergovernmental system where local government has become increasingly dependent on the State capital and Washington. Table VIII, page 24, indicates that during the 20-year period 1958-78, State governments as a whole increased their revenues by a greater proportion than either the Federal or local governments. This pattern reflects the increased reliance of State governments on sales and income taxes. Patterns of expenditure growth also reflect this increased fiscal power of State governments; direct spending by State governments over the same 20-year period grew at a faster rate than either Federal or local spending.

Direct spending at all levels of government exceeded the amounts that each level raised from its own sources. In the case of local and State governments, these differences were made up by aid from the higher levels of government. In the case of the Federal Government the difference between spending and tax receipts was funded through deficit financing.

TABLE VIII

Own-Source Revenues, and Spending, by Federal, State and Local Governments (billions)

Fiscal Year	Federal Own-Source Revenues*	Federal Expenditures**	State Own-Source Revenues *	State Expenditures**	Local Own-Source Revenues*	Local Expenditures**
1958	$ 86.0	$ 86.0	$ 21.4	$ 28.1	$ 23.0	$ 34.0
1968	165.2	184.5	52.5	66.2	47.9	72.4
% annual increase: 1958-1968	6.7%	7.9%	9.4%	9.0%	7.6%	7.9%
1978	$429.7	$479.3	$171.5	$203.8	$130.5	$211.1
% annual increase: 1968-1978	10.0%	10.0%	12.6%	11.9%	10.6%	11.3%

* Revenue figures exclude State government contributions to Workmen's Compensation System, but do include payroll tax contributions. State and local government contributions to own retirement systems are also excluded.

* For the purposes of the table, grants-in-aid appear as expenditures of both the grantor and the grantee.

Source: Bureau of the Census

The growth and proliferation of Federal programs has changed the intergovernmental system in that many Federal goals are being pursued through the grant-in-aid system, utilizing State and local governments as instruments of Federal policy.

The figures show, however, that Federal grants-in-aid have begun to level off in recent years. Such a leveling off confirms the general conclusion of this study that Federal goals may become increasingly difficult to reach in a stagflation economy.

Economic Stabilization

The role of Federal finance in stabilization policy has two aspects. On the one had, the level of the Federal budget outlays and the deficit, taken alone, have a direct impact on aggregate demand in the economy. On the other hand, the interactions between Federal outlays and the activities of State and local government activity raise important issues concerning the effectiveness of stabilization policy. Does rapid secular growth of Federal programs such as grants-in-aid contribute to counter-cyclical policy? Or does it simply add to the longer-term growth of Federal, State and local government?

Several studies for the SSEC tried to answer this question. All of them concluded that State and local governments' spending patterns respond relatively slowly to fluctuations in the business cycle and cannot be counted on to implement major Federal initiatives to stimulate or hold back the economy.

These conclusions are consistent with the record of government finance over the past decade. The time that it takes to create new jobs, from the onset of a recession to the time that Federal grant-in-aid programs begin to make their impact through State and local budgets, has been carefully documented and found in some cases to be substantial. This staff study concludes that Federal countercyclical grants-in-aid, while useful as a form of insurance to preserve the fiscal viability of State and local governments, are relatively ineffective in providing immediate stimulus to a lagging economy. Even if State and local spending does eventually reflect the increased grants-in-aid, the timing of this upswing may not coincide with the aims of Federal policy and would come too late to accomplish the original aims of the countercyclical grant program.

The Fiscal Year 1981 Budget documents that the spending effort aimed at combatting the 1973-75 recession had its maximum effect in 1978, with $5 billion of outlays. Spending from these programs in 1981 -- six years after the recession -- was estimated at $3.2 billion.

Many economists argue that the appropriate measure of the macroeconomic impact of government should include State and local fiscal positions added to the Federal Government deficit or surplus. In this view, the surpluses of some State governments in recent years flowed into the Nation's financial markets providing funds to help finance the deficits of other State and local entities and the Federal deficit itself. For analyzing the macroeconomic issues of monetary and fiscal policy, then, the consolidated "Government sector" budget position is the appropriate measure to use because of the extensive integration of Federal with State and local economic programs. According to some economists, one should not separate Federal from State and local budget activities for the purposes of macroeconomic analysis.

In the latter half of the 1970's, when the Federal Government was running up large deficits, State and local governments, in the aggregate, were posting relatively large surpluses. In 1979, the surplus in the total government sector stood at approximately $14 billion.

Different considerations apply when examining the problem from the point of view of an individual government. For example, overall figures on State and local governments misrepresent the position of individual governments and are consistent with a reduction in public services at the State and local level and a deterioration of their capital stock. Furthermore, fluctuations in the aggregate balance of State and local spending are varied and unpredictable and thus cannot be made the basis for Federal policy, even if they eventually have some influence on the stimulus or lack of stimulus coming from the government sector.

Federal grants-in-aid to State and local governments are a major aspect of Federal finance. This section illustrates some of the problems of using such grants as a part of economic stabilization policies. In the view of this study, Federal grants-in-aid are more useful when aimed at alleviating the specific problems of State and local governments of a continuing secular character which are addressed at the State and local level. Any improvements in the grant-in-aid system should be directed toward that end. In a concluding section, this study presents some recommendations on this issue.

Regional Disparities

The growth in Federal grants-in-aid has taken place against a background of population shifts among regions of this country as significant as the westward movement in the 19th century. The economic implications of these demographic shifts are enormous.

They account in large part for the difference between the economic conditions in the Northern Tier States and the more rapidly growing Southern Tier.

Economists disagree on whether differences in regional growth patterns are caused by differences in the distribution of Federal grants-in-aid, or whether the grants-in-aid simply follow regional trends. In an open economy such as the United States, there are no artificial barriers to the movement of labor, technology and other factors of production. As a result it is generally acknowledged that regional differences in living standards will tend to be equalized over time. Of course, some would argue that government spending has reduced some physical barriers, as in the Federal highway system. But differences in the rate of job formation in the "Sunbelt" States compared with the "Frostbelt" can also be explained by such other factors as the growth in telecommunications and air travel, the cost differentials of real estate in different parts of the country, and even the development of air conditioning.

This study, therefore, rejects the notion that the purpose of Federal aid should be to help equalize regional growth rates. Such a goal would require such large differences in the distribution of Federal aid as to be economically and politically impossible.

Conversely, there is a sound theorectical and public policy basis for directing aid at both the rapidly growing and the sluggish regions of the country. In the slower growing or declining areas, local governments will have to cope with public sectors that are overdeveloped based on the current population. New York State and local governments, for example, still spend nearly 40 percent above the per capita national average even though per capita personal income is barely 5 percent above the national average. But the fiscal adjustment for growing regions will also be extremely severe, as rapid growth requires an equally rapid development of public infrastructure. Average public sector wages in these growing areas are generally below the national average, which leaves these States more vulnerable to catch-up inflationary wage increases.

Conclusions

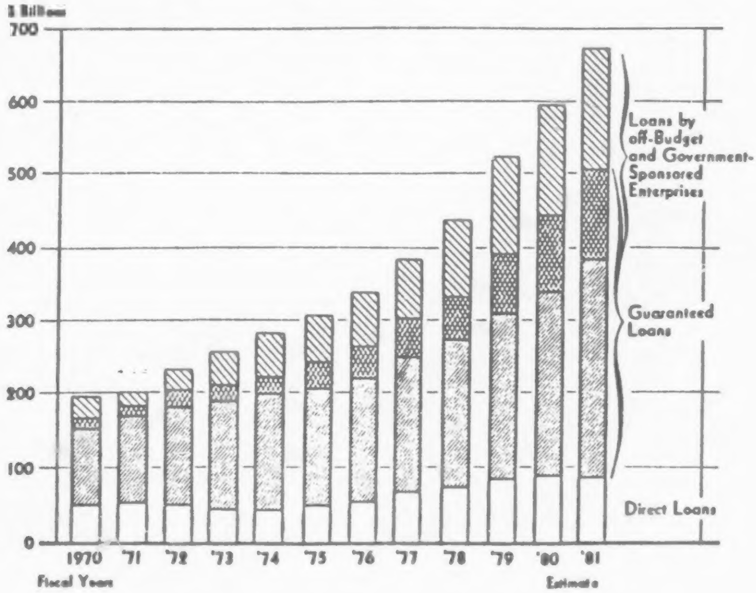
If the coming decade is to be characterized by slower GNP growth, both the growing and the declining States will suffer. The present system of enacting and administering categorical grant-in-aid programs, however, is possibly not suited to the challenges which will face the intergovernmental system in the 1980's. By definition, such programs are administratively cumbersome and in only a few cases are they specifically differentiated to deal with different, unique areas of the country. They cannot be enacted or implemented swiftly enough to counteract effectively the swings in the business cycle. Recent testimony before the SSEC indicates that the rate of increase in grant-in-aid programs is slowing and will continue to slow in the future. This observation appears to be commonly held by observers with otherwise different viewpoints. The coming decade would thus seem to require major improvements in the efficiency of such programs and their applicability to different local conditions.

V

FEDERAL CREDIT PROGRAMS

The magnitude of Federal credit programs, and their rapid growth in recent years, indicate their widespread use as an instrument for implementing Federal priorities. In the last 25 years, at least $1.5 trillion have been lent under Federal auspices. Total credit outstanding under such programs totaled over $500 billion by the end of fiscal year 1979; three-fifths of this amount reflects credit that has been advanced over the last 10 years. The following graph illustrates the growth in Federal credit activity:

Federal and Federally Assisted Credit Outstanding



Source: Special Analyses Budget of the U.S. Government FY81.

Because this chart illustrates total Federal credit outstanding, net credit advanced under Federal auspices in any one year is the difference between the credit outstanding in one year and that of the next.

One should exercise caution in assessing the growth of Federal credit activity. The reason is that the statistics give mixed answers about whether such activity is growing disproportionately fast.

Some economists point to the large numbers (e.g., $1.5 trillion in Federally sponsored credit extended over the past 25 years) or the increase in the level of credit outstanding (more than 160 percent since 1970) as proof of alarmingly rapid growth.

These figures, however, cloud the issue. The fact is that the amount of money advanced in the U.S. credit markets under Federal auspices has remained a relatively stable proportion of total monies advanced. The growth in total credit outstanding over the past decade has been slower than the growth in GNP. Finally, the U.S. government engages in less lending relative to national income than most other industrialized countries. Such findings suggest that, from a *resource allocation* standpoint, Federal credit activity has not had an unduly intrusive effect in the past 10 years.

From the point of view of *Federal program efficiency and control*, the statistics raise another set of issues. Net credit advanced under Federal auspices (i.e., Federal government loans and loan guarantees, including those of off-budget agencies, minus loan repayments) has been accelerating. For example, the rate of growth in net credit, which averaged 16.2 percent annually for the three years 1970-1972, rose to 40.5 percent for the last three years of the decade. Furthermore, the major growth came in those categories that do not show up in the budget: loan guarantees and the credit activity of off-budget agencies. On-budget credit activity grew at approximately the same rate as Federal budget outlays. As Federal budget constraints continue to grow, there will be a considerable incentive to utilize off-budget credit activities, even if their overall effects are not known.

Uses and Effects

In some respects Federal credit activity is no different from conventional Federal budget outlays. If a direct loan is made by the Small Business Administration so that a firm can expand its plant, for example, the transaction is recorded as a Federal budget outlay. Loan repayments are recorded in the Federal budget as an offset against direct loan outlays, so that the figure one sees in the budget totals each year is a net loan figure.

The Federal Government also engages in loan guarantee activities, by which the risk of the lender is minimized by substituting the pledge of the Federal Government to repay interest and principle in the event of the borrower's default. Loan guarantees, of course, do not appear as budget outlays, unless the Federal Government is called upon to make good its pledge.

A third form of credit activity is the direct loans and loan guarantees associated with so-called off-budget agencies such as the

Rural Telephone Bank and the Federal Financing Bank (FFB), and with government-sponsored enterprises such as the Federal National Mortgage Association and the Federal land banks.* The most important of these agencies in terms of loan volume and flexibility is the FFB. Because it is authorized to purchase loan assets from on-budget agencies, it can translate on-budget direct loans into off-budget activities. In FY 1979, the net loan outlays of the FFB amounted to $13.3 billion compared with a budget deficit of $27.7 billion.

Assessments as to the effect of Federal credit programs vary widely. Some studies maintain that such Federal activity displaces private sector activity. Others point to the magnitude of such programs and the numbers of borrowers who would not otherwise be able to obtain credit. They conclude that substantial resource allocation has taken place because of Federal credit programs.

This study finds some merit in both arguments but recognizes the difficulty in drawing any hard conclusions about the effect of credit programs. A recurring theme, however, is that the effects of such programs depend in large part on (1) the class of beneficiary and (2) the length of time the program has been in effect. These factors are explained as follows:

- *Class of beneficiary* -- Many beneficiaries of Federal loan and loan guarantee programs represent too high a risk to obtain financing from conventional sources. Federal credit programs accord with the policy determination that such classes of beneficiaries (e.g., the victims of natural disasters or such high risk ventures as synthetic fuel development) are proper subjects for Federal aid. The record of and outlook for such kinds of programs indicate that they will continue to be utilized to provide assistance for these classes of marginal and high-risk borrowers.
- *Duration of program* -- Although the evidence and research is spotty, the general finding of economists appears to be that Federal credit activity loses its effectiveness over the long term, even though short-run effects have been found to be immediate and positive. This depends on the type of program and on the

---

* Off-budget agencies are Federally owned and controlled, but their enabling legislation excludes their operations from the budget totals. Except for the FFB, their activities have a minimal overall impact on the economy. Estimated net outlays in FY 1980 are estimated at $16.8 billion, of which the FFB accounts for $16.4 billion. Government-sponsored enterprises are privately owned organizations established and chartered by the Federal Government to carry out specialized credit functions such as housing loans. Net loans of Government-sponsored enterprises during 1980 are estimated at $15.1 billion.

creditworthiness of the borrower. In the one area that has been the subject of the most intense analysis, housing, economists generally have found substantial short-run effects from the introduction of Federal credit programs. But they have also found that the net additions to the mortage stock were small, compared with the size of the Federal initiative, over the long run.* In other words, the Federal housing credit programs tended to displace private lending, or set up reactions in the financial markets -- e.g., small movements in investment yields causing some interest-sensitive funds to shift into other investments. This diluted the ability of the programs to create large amounts of additional housing even if the program goals of making housing more available to certain classes of people (e.g., veterans) were being met.

One theme of the SSEC as a whole is that the economy has undergone basic structural changes, of which the problems of stagflation are one symptom. These changes are often cited when Federal credit programs are recommended for large ailing entities such as New York City and the Chrysler Corporation. This use of Federal credit activity is relatively recent. It could have profound implications in terms of the protection of inefficient sectors of the economy and the possible exposure of the government to the financial risk of large bankruptcies. On the other hand, if the credit activity enables the beneficiary, whether a unit of government or a large corporation, to adapt to changing circumstances, it could become a useful tool for promoting structural adjustment in the economy.

The Administration has proposed a credit control system for the FY 1981 budget, which for the first time sets limits on certain types of Federal credit activity. Eventually, the control system will encompass virtually all Federal credit activities and thus give the government the kind of control which it possesses over other Federal outlays.

Conclusions

The empirical evidence raises some questions about the ability of Federal credit programs to achieve their original goals over the long run. On the other hand, the short run benefit can be substantial. Thus they could play an important role in helping certain firms or units of government adjust to changing circumstances in the economy. If narrowly focused, such programs would not be irresponsible, since borrowers (as opposed to grant recipients) must demonstrate creditworthiness. Nor would continued growth in these programs pose an immediate threat of runaway government activity, since the levels of credit extended under Federal auspices have been rising slower than the gross national product.

---

* Aragon, George, *Federal Credit Programs* (Joint Economic Committee, SSEC, 1980), citing Break (1961), Duesenberry/Bosworth (1973), Duesenberry/Bosworth (1974), Hendershott (1977), and Jaffee/Rosen (1978).

VI

SUMMARY AND RECOMMENDATIONS

Several common threads run through the conclusions to each of the chapters in the preceding analysis:

- Federal tax and spending programs have transformed over the past quarter century in response to America's growing affluence and changing perceptions in this country about the appropriate role of government. These factors together have influenced the distribution of the GNP among national defense, basic necessities and other major areas. At the same time, and partly because of this country's affluence, remarkable progress has been made in the pursuit of such goals as eradicating poverty and making quality health care available to all Americans.
- At present low rates of GNP and productivity growth, and with the steady increases in spending for domestic assistance programs, this country will have trouble financing the stated goals of Federal policy over the next several years.
- Policies that increase the overall rate of growth in the economy are now critical to maintaining this country's ability to meet the competing claims on national product.
- Not only have Federal domestic assistance programs often failed to achieve program goals, but they have sometimes complicated the conduct of Federal macroeconomic policies.

In summarizing the efforts of Federal financial activity, this staff study also makes a political observation. The myriad of Federal programs -- including the transfers, grants-in-aid and credit activities referred to in other parts of this study as well as tax benefits -- have political constituencies that make any significant "reform" of such programs a difficult task. Even if such programs were shown to be cumbersome, inefficient and replete with undesirable side-effects, certain well-represented groups do in fact benefit from them. The close relationship among congressional committees, Executive Branch agencies and special interest groups may lead to the durability of many such programs, even when these programs come under severe attack.

Adjustments will need to be made, through the political process, to resolve the competing claims on the national output represented by such Federal program goals such as income security, higher levels of capital investment, and more defense spending.* If the debate over the congressional budget resolution for FY 1981 has shown anything, it is that U.S. political institutions are not always well-adapted to changed conditions like the present. Accordingly, the following recommendations deal not only with matters of macroeconomic grwoth and regional growth, but also institutional reform.

Macroeconomic Growth

Conventional economic theory suggests that the growth needed to accommodate future claims on output can come about most easily through monetary and fiscal stimulus. Yet, this is precisely the policy that would exacerbate the existing inflation problem, leading to a new and worse round of demand-induced price increases. A separate staff study for the SSEC suggests a dual approach to stimulating production without inflation. This approach would consist of tax reductions designed to stimulate business capital formation and personal saving, coupled with a reduction in the rate of growth in government expenditure.

Such a major change in Federal policy will be difficult to implement politically. This is because the persistent growth in relatively uncontrollable spending, dominated by consumption-oriented outlays such as income transfers, leaves little room for new Federal initiatives. For example, a decision to foster capital formation through large tax cuts, while maintaining real levels of spending in other areas, could imply tight control over some of the government's most popular programs. Again, the issues come back to the challenges to the political process, and more specifically to the way this country chooses to allocate Federal outlays.

A major reorientation of policy towards incentives to stimulate capital formation may also require some adjustments in Federal policy toward government regulation. This need not be construed as a license for unbridled greed in the private sector. However, it does imply a more cost-conscious approach to regulatory policy. A separate staff study for the SSEC, "Government Regulation: Achieving Social and Economic Balance," examines some of the ways to improve cost-consciousness such as implementing a regulatory budget, coordinating the reporting requirements of regulatory agencies, and imposing performance standards rather than design standards on environmental regulation.

---

* Of course, the Congress could choose to resolve these claims by raising taxes, allowing excess government deficits to raise the inflation rate, or borrowing from abroad. This study assumes that none of these alternatives is acceptable.

No report of this nature would be complete without some recognition of the need for improvements in the efficiency of government. This staff study does not examine such aspects of government as the organization of Executive Branch departments, personnel procedures, and procurement regulations. It does, however, suggest some guidelines for reforming the operation of several types of government programs. There should be a systematic review, for example, of Federal credit activities, to ensure that the market imperfections that gave rise to the credit programs still exist. This is important due to the finding that some types of credit programs may lose their effectiveness over the long run. Federal grants-in-aid, as explained below, should be more differentiated according to the different needs in various parts of the country.

Regional Growth

A discussion of the differences in Federal grants-in-aid which are needed for growing, versus declining, regions of the country appears in detail in a separate study for the SSEC. It is also summarized in this staff study's consideration of grants-in-aid. What the discussion and summary imply is that programs enacted for use by all types of State and local governments fail to take into account the particular needs of areas with different economic characteristics. This study notes that some grant-in-aid programs are enacted to deal with peculiarly local or regional problems (e.g., coastal energy impact assistance, disaster relief, etc.). However, there is no systematic approach to enacting grant-in-aid programs on the basis of regional need.

Institutional Reform

Institutional reforms fall into two categories: those that help provide policymakers with needed information for making decisions, and those that might change the decisionmaking process itself. The former category would encompass recommendations for publishing a GNP budget and a regulatory budget as part of the budget process each year. Both these measures would apprise policymakers of some of the otherwise hidden costs of legislation and of the need to make Federal policy goals consistent with this country's ability to produce.

Institutional reforms in the decisionmaking process are necessary because of the clear political component in any discussion of Federal finance over the coming decade. The decisions on how to resolve competing claims on the Federal budget and competing claims on national output will ultimately be made in a political context, and this staff study indicates that those decisions will pose severe challenges to the U.S. political system. What they will require, in effect, is a new political consensus on how to allocate the burden of taxation and the benefits of Federal assistance during a phase of substantial economic adjustment.

Congress has already taken one major step in this direction. With the passage of the Congressional Budget Act, Congress undertook for the first time to coordinate the enactment of spending measures with its assessment of the proper overall fiscal impact of the Federal Government. One study prepared for the SSEC concludes that while this legislation has not substantially altered the budget figures, it has shifted the focus of decisionmaking toward Congress. It has also provided Congress with the kind of information needed to make more intelligence budget decisions.

One proposal before Congress would set up a bipartisan Commission on More Effective Government, patterned after -- but more comprehensive than -- the first Hoover Commission of 1947.

The purpose of the proposed Commission, which would consist of high level members from both public and private life, would be to develop a blueprint for processes that would make the Federal Government more responsible and accountable. The Commission's work would include an examination of all of the overlapping programs within the Federal Government which, in turn, interact with related programs at State and local levels. It would make its recommendations to the Congress at the end of its two-year life. The Commission would not be a study group, but rather a mechanism for generating a political consensus for adjusting Federal policy to the coming decade.

Authors of Selections

GEORGE ARAGON, *Boston College*
GEORGE F. BREAK, *University of California, Berkeley*
CARL F. CHRIST, *Johns Hopkins University*
SHELDON DANZIGER, *University of Wisconsin*
RUDIGER DORNBUSCH, *Massachusetts Institute of Technology*
EDWARD M. GRAMLICH, *University of Michigan*
ROBERT HARRIS, *The Urban Institute*
ROBERT H. HAVEMAN, *University of Wisconsin*
WALLACE E. OATES, *University of Maryland*
ROBERT D. PLOTNICK, *Dartmouth College*
FRANK C. RIPLEY, *Consultant*
HARVEY S. ROSEN, *Princeton University*
RONALD L. TEIGEN, *University of Michigan*

Contributors of Peer Reviews

ALAN S. BLINDER, *Princeton University*
WILLIAM BRANSON, *Princeton University*
GEORGE F. BLEAK, *University of California, Berkeley*
HARVEY BRAZER, *University of Michigan*
PETER K. CLARK, *Stanford University*
SHELDON DANZIGER, *University of Wisconsin*
PETER GOTTSCHALK, *Bowdoin College*
ALAN GUSTMAN, *Dartmouth College*
ROBERT W. HARTMAN, *Brookings Institution*
GEORGE JAKUBSON, *University of Wisconsin*
DARWIN G. JOHNSON, *Brookings Institution*
MARVIN B. JOHNSON, *University of Wisconsin*
HYMAN MINSKY, *Washington University*
DOUGLAS A. NORWOOD, *Office of Management and Budget*
JOHN PALMER, *Department of Health and Human Services*
RUDOLPH PENNER, *American Enterprise Institute*
ROBERT SAMMONS, *Consultant*
TIMOTHY SMEEDING, *University of Utah*
ROBERT SOLOW, *Massachusetts Institute of Technology*
JAMES STOREY, *Urban Institute*
JAMES TOBIN, *Yale University*
MICHAEL WEINSTEIN, *Haverford College*
WILLIAM L. WHITE, *Harvard University*

Author's Biographical Data

George Aragon is Assistant Professor of Finance and Controllership at Boston College. He recently served as a consultant to the Congressional Budget Office in the area of budget control legislation and credit activity, and is a lecturer for the American Management Association.

George F. Break is Professor of Economics and former Chairman of the Department of Economics at the University of California, Berkeley. He has published extensively in the field of Public Finance, specifically in the area of taxation.

Carl F. Christ is the Abram G. Hutzler Professor of Political Economy at the Johns Hopkins University. He is a former member of the Maryland Governor's Council of Economic Advisors. Currently, he is on the Board of Directors of the National Bureau of Economic Research, representing the American Economic Association, and on the Council of the Econometric Society.

Sheldon Danziger is Associate Professor of Social Work at the University of Wisconsin, Madison, and Research Associate at the Institute for Research on Poverty. His previous research has included articles on income inequality, welfare reform, the War on Poverty, and the analysis of social welfare programs.

Rudiger Dornbusch is Professor of Economics at the Massachusetts Institute of Technology. He most recently served as a senior advisor on the Brookings Panel on Economic Activity and is a research fellow at the National Bureau of Economic Research. He currently holds editorial positions on the *Journal of International Economics*, the *Journal of Finance* and the *American Economic Review.*

Edward M. Gramlich is Professor of Economics and Director of the Institute for Public Policy Studies at the University of Michigan. Formerly he was a Senior Fellow at the Brookings Institution and Director of the Policy Research Division at the Office of Economic Opportunity. His principle areas of research are applied macroeconomics, public finance, program evaluation, and income distribution.

Robert Harris is Executive Vice President of the Urban Institute, where he has been on the staff since 1971. Formerly he served as Deputy Administrator of the New York City Health Services Administration for Planning and Budget, and Executive

Director of the President's Commission on Income Maintenance Programs. He has published widely in the fields of public finance and social welfare policy.

Robert H. Haveman is Professor of Economics and former Director of the Institute for Research on Poverty at the University of Wisconsin. He serves on the Board of Editors of *Land Economics* and the *Journal of Human Resources*. He is also a member of the Board of Officers at the American Association of Environmental Economists and of the Advisory Committee on Evaluation of Research at the Russell Sage Foundation.

Wallace E. Oates is Professor of Economics at the University of Maryland. His fields of specialization include public finance -- particularly State and local finance, urban economics and environmental economics. He is on the Board of Editors of *Public Finance Quarterly* and the *National Tax Journal* and is a member of the Committee of Technical Advisors for Tax Policy Research at the American Enterprise Institute.

Robert D. Plotnick is Assistant Professor of Economics at Dartmouth College, and currently a Research Associate at the Institute for Research on Poverty, University of Wisconsin. He has worked as a consultant for the Department of Labor. His primary research areas are income support policy, poverty, and income distribution.

Frank C. Ripley is private economic consultant, specializing in economic impact analyses, economic forecasting and econometrics. He is the former senior economist and Washington regional manager for Data Resources, Incorporated and previously, the senior staff economist at the Council of Economic Advisors.

Harvey S. Rosen is Assistant Professor of Economics at Princeton University. His area of specialization is taxation, and he has served as a consultant to the U.S. Treasury, Office of Tax Analysis.

Ronald L. Teigen is Professor of Economics at the University of Michigan. His fields of expertise include monetary, fiscal and international economics. He is a consultant and former Deputy Assistant Director for Fiscal Analysis at the U.S. Congressional Budget Office.

Volumes of the Special Study on Economic Change

Human Resources and Demographics
Energy and Materials
Research and Innovation
Stagflation
Government Regulation
Federal Finance
State and Local Government
Social Security and Pensions
The International Economy
Productivity

The Federal Finance section of the Special Study on Economic Change, Joint Economic Committee, is one of 10 sections of the SSEC. Orders for this study may be placed by contacting:

Joint Economic Committee
Room G-133
Dirksen Senate Office Building
Washington, D.C. 20510
Telephone: (202) 224-5321

State and Local Finance:

Adjustment in a Changing Economy

Joint Economic Committee

Special Study on Economic Change

A staff study

December 1980

(295)

The Joint Economic Committee's Special Study on Economic Change (SSEC) was inaugurated under the leadership of then Chairman Richard Bolling (D.-Mo.) and Vice Chairman Hubert H. Humphrey (D.-Minn.), together with Senator Jacob K. Javits (R.-N.Y.), ranking Minority Member.

The study progressed through Mr. Bolling's chairmanship and into the leadership of Senator Lloyd Bentsen (D.-Tex.), chairman; and Congressman Clarence J. Brown (R.-Oh.), ranking Minority Member. The goal of the SSEC is to chart the major changes in the economy and to analyze their implications for policymakers.

JOINT ECONOMIC COMMITTEE

LLOYD BENTSEN, Texas, *Chairman*
RICHARD BOLLING, Missouri, *Vice Chairman*

SENATE

WILLIAM PROXMIRE, Wisconsin
ABRAHAM RIBICOFF, Connecticut
EDWARD M. KENNEDY, Massachusetts
GEORGE McGOVERN, South Dakota
PAUL S. SARBANES, Maryland
JACOB K. JAVITS, New York
WILLIAM V. ROTH, JR., Delaware
JAMES A. McCLURE, Idaho
ROGER W. JEPSEN, Iowa

HOUSE OF REPRESENTATIVES

HENRY S. REUSS, Wisconsin
WILLIAM S. MOORHEAD, Pennsylvania
LEE H. HAMILTON, Indiana
GILLIS W. LONG, Louisiana
PARREN J. MITCHELL, Maryland
CLARENCE J. BROWN, Ohio
MARGARET M. HECKLER, Massachusetts
JOHN H. ROUSSELOT, California
CHALMERS P. WYLIE, Ohio

JOHN M. ALBERTINE, Executive Director
LOUIS C. KRAUTHOFF II, *Assistant Director-Director, SSEC*
RICHARD F. KAUFMAN, *Assistant Director-General Counsel*
CHARLES H. BRADFORD, *Minority Counsel*

Table of Contents

CHAIRMAN'S INTRODUCTION i
Senator Lloyd Bentsen

RANKING MINORITY MEMBER'S INTRODUCTION ii
Rep. Clarence J. Brown

I. INTRODUCTION 1

II. THE REGIONAL REVOLUTION 3

III. THE FISCAL FACTOR AND THE BANKRUPTCY ISSUE 10

IV. A POLICY FRAMEWORK 15

CHAIRMAN'S INTRODUCTION
Senator Lloyd M. Bentsen
Chairman, Joint Economic Committee

Two future prospects for some major American cities are painted in this study on State and Local Government. One is not so pretty; the other offers hope for more vibrant urban communities.

If the economy continues on a stagnant course, if unemployment and inflation remain high, then massive service disruptions -- if not outright default -- could result in some localities, most but not all of them large cities in the North.

There is, however, another course. This study emphasizes that non-inflationary growth is essential to real income growth and central to the resolution of the fiscal problems of many of the Nation's cities. This study reminds, "The single most important thing that the Federal Government can do to meet the needs of State and local governments is to stabilize the national economy and return it to a path of economic growth. Recession reduces the revenues of local governments and at the same time increases the demand for public services. When recession is coupled with rapid inflation, the results are even more dangerous to the financial health of local governments."

Much of the debate of late regarding the growth regions of the country and the older areas has involved the issues of people-to-jobs vs. jobs-to-people, as stressed in the Agenda for the 80's study. However, this study points out that there is no conflict between a national economic growth strategy and the economic needs of the Nation's people and regions, nor between the people-to-jobs and jobs-to-people approaches. The goal of faster economic growth enforces the logic of a policy strategy that utilizes the best of the people-to-jobs and jobs-to-people worlds. One approach must not necessarily be at the expense of the other.

More at issue is this question: The prospects of city financial emergencies in a stagnant economy could bring to a head the question of whether these crises are more properly the concern of the states than of Federal Government. There could well be a day of reckoning between the Sunbelt and the Snowbelt if cities in declining regions seek Federal bailouts in this decade.

This study suggests we may have to answer these questions: Should the Federal Government consider massive emergency financial assistance to a city when the city's State government is experiencing strong fiscal health? Or, when state law has kept that city's land area the same even as its suburbs experienced excellent growth? These are questions that may have to be answered if the Nation's economy continues on its stagnant course.

I would rather we never have to respond to such issues, and I don't believe we will if we take the necessary steps to turn the economy around. Policy considerations provided in this study to increase opportunities in urban areas include:

- Targeted incentives to private sector employees -- particularly in small business -- to effectively train and hire the structurally unemployed.
- The increase of investment tax credits for the rehabilitation of industrial and commercial structures to help revitalize urban centers.
- Modifications of the investment tax credit to supplement the simplified cost recovery system in order to encourage additional investment in plant and equipment.
- Continuing emphasis on underlying issues which result in minority unemployment, such as inadequate basic education, training, knowledge of employment opportunities, and other labor market difficulties.
- Assistance in the adjustment of workers displaced because of technological change or international competition, with direction toward training, retraining, employment and reemployment in growth industries, rather than exclusively as supplementary unemployment insurance.

In considering such policy options, decisionmakers should also be reminded that a previous study by the Special Study on Economic Change, "Federal Finance," rejected the notion that Federal Government policy should seek to equalize the economic differences that are causing conflict between the Sunbelt and the Snowbelt. That study said a goal of equalization would require such large differences in the distribution of Federal aid as to be economically and politically impossible; and, it wouldn't equalize the growth.

This study supports that finding and expands on considerations for the proper roles of Federal, State and local Governments.

Ranking Minority Member's Introduction
CONGRESSMAN CLARENCE J. BROWN

The theme of this staff study is straightforward: The growing burden on our State and local governments is a direct result of slow growth, high inflation, reduced productivity growth, and declining international competitiveness. The combination of rising costs and increasingly volatile demand has been a catalyst not only to the decline of many of the Nation's basic industries, but to a massive shift of people and jobs away from the Nation's older regions and toward the younger, less developed regions. Left in the wake of these regional shifts is a pattern of seriously deteriorating conditions -- particularly in the Nation's older cities.

During the 1962-1978 period, a majority of the Nation's new industrial jobs were generated outside metropolitan areas. The result has been a growth of poverty concentrations in cities that offer fewer job opportunities.

While the total poverty population remained at roughly 24 million persons between 1969 and 1978, this numerical stability masks a shift in the distribution of poverty within the economy. Whereas the non-metropolitan poverty count fell by more than 1.6 million, the central city count increased by well over one million people. The growth of metropolitan poverty, in turn, has pushed up the demand for State and local government services at a time when tax bases have eroded.

While many State and local governments have become less able to provide services to an increasingly dependent population, the role of the Federal Government has increased. Between 1955 and 1979, Federal grants to State and local governments increased from $3.2 billion to $82.9 billion per year. As a result, in 1979, revenues from the Federal Government represented 31 percent of State and local government receipts, as compared to 12 percent in 1955.

But if the growth of Federal inter-governmental assistance has been rapid, the massive inflow of direct Federal aid to State and local governments may well have peaked. Increasing concern with the inflationary impact of Federal spending, the increased emphasis on defense spending, and the growth of so-called "uncontrollable" items in the Federal budget will act to retard the growth of Federal inter-governmental aid. This will put added pressure on State and local governments -- at precisely the time when expenditure cutbacks and deferrals will be increasingly difficult to sustain. As an illustration, gross capital expenditures have declined from 29 percent of State and local spending in 1965 to 14 percent in 1977. But the laws of friction have not been repealed; capital maintenance and replacement cannot be put off indefinitely.

The problems of the Nation's older and younger regions have a common denominator: Their resolution will require that the upward pressure on State and local spending be reduced, and that tax revenues be sufficient to finance those expenditures that must be undertaken.

It is for this reason that the most important thing that the Federal government can do for State and local governments is to return the national economy to a path of increased economic growth; a growth path that will reduce the demand for government services at the same time it generates additional tax revenues.

Money growth that has been too rapid, a tax burden that is too heavy, regulatory mandates that have not been cost effective, and economic policies that have encouraged consumption while discouraging saving and investment have not only driven up inflation; they have reduced real incomes and slowed economic growth.

The way to break the dependency cycle now being perpetuated in our declining cities is to encourage the creation of productive, private sector jobs with a future. There is no better way to ensure that this will happen than to put the economy on a more rapid growth trajectory. This is the only true jobs to people strategy; a strategy that requires that economic policy focus on pulling up real incomes at the same time as it reduces upward pressures on costs of production. A policy prescription of reduced monetary growth, lower taxes, lower Federal spending, and reduced regulatory burdens is the way to bring this about.

Volumes of the Special Study on Economic Change

Human Resources and Demographics
Energy and Materials
Research and Innovation
Stagflation
Government Regulation
Federal Finance
State and Local Government
Social Security and Pensions
The International Economy
Productivity

Special Study on Economic Change

Louis C. Krauthoff II, *Director*
George D. Krumbhaar, Jr., *General Counsel*
Bill R. Maddox, *Editor*

STATE AND LOCAL GOVERNMENT
Adjustment in a Changing Economy

Director of Technical Studies:
Roy Bahl
Area Director
State and Local Government

Staff Study prepared by:
R.D. Norton
Assistant Professor of Economics
Mount Holyoke College

Associate Contributors:
George D. Krumbhaar, Jr.
General Counsel, SSEC

Deborah Matz
Economist, JEC

Timothy P. Roth
Senior Economist, SSEC

STATE AND LOCAL FINANCE:

Adjustment in a Changing Economy

I

INTRODUCTION

For the past three decades, there has been rapid expansion of intergovernmental aid, and in the size and importance of State and local government.

In 1950, State and local government expenditures represented eight percent of Gross National Product (GNP). Today these expenditures command approximately 14 percent of GNP. In 1950, Federal grants to State and local governments totaled $2.3 billion, representing 10 percent of State and local government expenditures. In 1980, Federal grants totaled $89 billion, or 25 percent of State and local government expenditures.

In recent years, local and regional economies have been dramatically altered by massive shifts in jobs and population. Many previously thriving industrial cities have found plants closing, unemployment rising, the middle class leaving, and their financial structures decaying. Other cities experiencing rapid growth in population have found that their stock of housing, schools, roads, and sewers no longer adequate, that services must be expanded, and that crime is rising.

In attempting to deal with these problems, the various levels of government continue to duplicate some functions while neglecting others. The intergovernmental system has become a morass of red tape, forms, and mandates. Programs are developed largely on an ad hoc basis, with little regard for efficiency or coordination either among different agencies or among different levels of government.

One of the major problems confronting the United States is that government does not work very well -- not just the Federal Government, but the Federal Government in relation to other levels of government. The future of State and local government finance will directly impact this relationship, as will the state of the national economy.

But if an improvement in intergovernmental relations is imperative, so is the formulation of new policies to combat urban decline.

This study focuses on the present and potential linkages between national, state and local urban policy and the goal of faster national economic growth. It emphasizes that effective policies for improving the living standards of urban dwellers go hand in hand with the equally urgent goal of accelerated U.S. economic growth. The study begins with an overview of the regional decentralization of manufacturing jobs, a key influence on the opportunities available to people in older cities.

Fiscal factors, another such influence, are also considered. A concluding section lists policy proposals designed to foster faster economic growth, to reduce unemployment and inflation, and, in general, to assist the urban dweller in securing jobs with a future.

II

THE REGIONAL REVOLUTION

A common denominator of national and world economic change during the past generation has been the age factor -- the rise of younger, initially less developed economies and the eclipse of established older centers.

Within the United States, there is contention that regional realignments have dominated city-suburban and urban-rural shifts, leaving some of the Northeast and Midwest -- especially the Nation's older cities -- economically stagnant, and the South and West regions attempting to meet the challenges of growth. The result has been economic and fiscal distress for many cities and their residents.

The stagnation of the Northeast and Midwest can be linked in part to their advanced economic "age." Age in this context refers to the timing of a region's formative industrial development. By way of background, the Nation's late 19th-century industrial revolution had as its focus the regional complex extending from New England south through Pennsylvania and west to the Great Lakes. Meantime, the rest of the economy remained largely pre-industrial, providing foodstuffs and raw materials for the core industrial region.

On the eve of World War I, New England, the Middle Atlantic states, and the Lakes area were thus already heavily specialized in manufacturing. As Table I shows, each of the three divisions had population shares in manufacturing jobs well above the U.S. average. By contrast, the Southern and Western divisions -- with their still rural, resource-oriented economies -- had below-average shares.

The three oldest divisions today are New England, the Middle Atlantic, and East North Central (or Lakes) areas -- which together encompass the core industrial complex of the "Manufacturing Belt." The "youngest" are the Mountain and Southwest (or West South Central) divisions.

By no coincidence, the area stretching from Baltimore to Chicago is virtually co-extensive with the old industrial core region. The reason is that a region's economic performance, as gauged by its employment growth in manufacturing, has since the mid-1960's depended largely on its age.

Since the mid-1960's, a region's economic performance, as gauged by its employment in manufacturing, has depended largely on its age.

As Table I shows, the youngest geographical divisions had the highest rates of growth in industrial jobs between 1966 and 1979, while the three oldest divisions all lost such employment. In turn, each division's *total* employment growth has varied correspondingly, ranging lower in the older divisions, and higher in the younger ones. As a corollary, unfortunately, the service sector

TABLE I

Regional Age and Industrial Growth, 1966-1979

Area, in order of 1909 share	Population share[1] in manufacturing 1909	Percentage change in manufacturing jobs, 1966-1979
New England	17.2	- 3.2
Middle Atlantic	12.3	-15.5
East North Central (lakes)	9.0	- 1.3
(U.S. Average)	(7.7)	(+ 8.0)
Pacific	5.7	+25.2
South Atlantic	5.5	+20.6
West North Central	3.5	+20.0
East South Central	3.3	+26.8
Mountain	3.1	+71.8
West South Central	2.5	+51.7

[1] Column 1 is based on data in U.S. Bureau of Economic Analysis, *Long-Term Economic Growth, 1860-1970* (Washington, D.C., 1973), p. 72. Column 2 is based on data in *Employment and Earnings, States and Areas: 1939-1978*, Bureau of Labor Statistics, and *Employment and Earnings, June, 1979* (May averages used).

did not emerge in this period as an "engine of growth" that replaced the loss of the manufacturing jobs. Manufacturing was in that sense basic to a division's broad economic performance.

But the link between age and industrial performance remains to be explained. Three intertwined processes are at work: (1) industry aging over the product cycle, (2) political aging as an influence on business climates, and (3) the capacity to serve as a seedbed for new firms and industries.

Industry Aging Over The Product Cycle

As the geographical focus on the 19th-century industrial revolution, the Manufacturing Belt has more than its share of the Nation's older industries. That obvious correspondence is a key to the Belt's economic vulnerability.

As its industries age, two things happen to jeopardize a region's economic position. One is that markets for industry output gradually become saturated. The second consequence of industry aging operates not through demand, but on the supply side. An industry ages not in a continuous timewise fashion, but only to the extent that production techniques become standardized. When that happens, the industry itself becomes "exportable" to competing, less developed areas, whether domestic or foreign. The second result, then, is to make production relatively footloose -- and hence more responsive to market location, to labor costs, and to business climate influences generally.

This product-cycle scenario has been played out repeatedly in the 20th-century Manufacturing Belt. Soon after World War I, the textile industry in New England started to migrate to the Southeast. (The Southeast later would become vulnerable to competition from East Asia). Similarly, since the late 1960's the Middle Atlantic states, spearheaded by New York City, have had precipitous job losses in the apparel industry, which has also migrated South and West and abroad.

Political Aging and State Business Climates

Industrial aging is affected by a second type of structural maturation -- one that shapes fiscal variables and, more generally, state business climates. State political systems tend to reflect the timing of a state's industrialization. Many states of the Manufacturing Belt (and of the middle-aged Pacific Rim) thus display higher levels of taxation and government activity, as well as more reliance upon local government.

It is more than a coincidence that business climates are as a rule more pro-business in the younger regions than in the states of the Manufacturing Belt. One indicator of this tendency for the 1954-1973 period is the rate of growth of combined state and local tax burdens. Relative tax burdens increased faster than the national average rate in most older states, and more slowly in most younger ones. A more comprehensive indicator shows an even closer correspondence. The Fantus Corporation's composite index of state business climates as of the mid-1970's found virtually all the states with the "best" business climates in the South and West, and vice-versa.

To that extent regions can be said to age in an institutional as well as an industrial sense. Depending on political sentiments, of course, some will see political maturation as progress. The point here is less one of value distinctions than of locational influences. Empirically, it seems certain that business climate variables have hurt the competitive positions of the long-industrialized states. Insofar as their industries are older (and hence more mobile), their business climates and institutions may add to their vulnerability.

If so, then a region's capacity to spawn new industries to replace the old will become a key influence on its economic position.

Innovation and Rejuvenation

An economy that can spawn new industries through innovation can neutralize the age factor. Despite its age, for example, the Manufacturing Belt continued to hold about half again as much of the Nation's industrial employment as of its population until after World War II. The reason was that it served as the national economy's "seedbed" for new industries. The Belt's figurative monopoly on the seedbed function resulted from a variety of factors, including its prominence as a national market, and as a center of finance, technical services, and science.

But the linchpin for its seedbed role was its machine tool industry, an industry that by mid-century was already giving way to more science-based, innovation-spawning activities. As industrially diverse centers of innovation developed elsewhere in the economy, the Manufacturing Belt experienced a progressive weakening of its capacity to spawn new development and so to rejuvenate itself.

Yet, within the Manufacturing Belt there are areas enjoying internally generated rejuvenation. An example is New England. As the Nation's oldest region (in an industrial sense), New England has emerged from a half-century of stagnation with an industrial structure reorganized around its knowledge base. So while it is "old" in terms of an objective indicator, its recycling as a high-technology center shows that age is by no means deterministic.

Declining Opportunities

The economic decline of the Nation's older cities creates the prospect of long-lasting urban unemployment. As manufacturing jobs have decreased in number in older cities since World War II, the skill-building process has slowed, making it increasingly difficult for urban dwellers to find promising entry-level jobs.

The number of central-city residents living in poverty increased sharply during the seventies. As Table II shows, the total poverty population remained roughly constant between 1969 and 1978, at about 24 million people. But this numerical stability was

TABLE II

Rise in Central City Poverty, 1969-1978

Persons below poverty line (in 000s)	1969	1978	Change 1969-1978
Total	24,147	24,497	350
Nonmetropolitan	11,063	9,407	-1,656
Metropolitan	13,084	15,090	2,006
Outside central city	5,091	5,805	714
Inside central city	7,993	9,285	1,292
Proportion (Percent)			
Total	100.0	100.0	--
Nonmetropolitan	45.8	38.4	-7.4
Metropolitan	54.2	61.6	7.4
Outside central city	21.1	23.7	2.6
Inside central city	33.1	37.9	4.8

Source: Bureau of the Census, Series P-60, August 1980 accompanied by clear changes in the distribution of poverty within the economy. In particular, the non-metropolitan poverty count fell by more than 1.6 million, while the central-city count increased by well over a million people.

The rapid increase in central-city poverty reflects deteriorating city economic conditions, *not* the migration of more poor people to cities. In an historic reversal, the seventies saw a slight net out-migration of the poor from the Manufacturing Belt to the rest of the Nation. As a second and related shift, there was also a net movement of 2.3 million people from metropolitan to non-metropolitan areas.

The reduction in non-metropolitan poverty highlights economic growth's impact on poverty rates. A majority of the Nation's new industrial jobs during the 1962-1978 period were generated outside metropolitan areas. As one part of this general economic advance, non-metropolitan black poverty decreased at a rate of almost 100,000 a year between 1969-1978.

Only job opportunities can break the dependency cycle now being perpetuated in the declining older cities. Yet these cities no longer generate the kinds of jobs that once provided a foothold for unskilled immigrants. A specific event that occurred in September 1980 is particularly illuminating.

A Federal office in Baltimore accepted applications for 75 entry-level jobs ranging from clerical worker to warehouse duties. The jobs carried salaries ranging from $7,210 to $11,565. In response, more than 26,000 people lined up in the course of two days to obtain application forms.

That stark episode points up dimensions of the problem. It also defines the challenge confronting policy. How can promising entry-level jobs be made accessible to the urban dwellers who want to work?

The Upgrading Issue

Indicators of the regional revolution are by now familiar. The lion's share of the Nation's population growth in the 1970's occurred outside the Northeast quadrant. Together, New England, the Middle Atlantic states, and the Upper Midwest added a mere one percent to their numbers between 1970 and 1979. Out-migration from these areas meant that over 90 percent of the national population increase took place in the South and West.

Population shifts per se are not a problem, signalling as they do but another chapter in the Nation's long-term economic development. What does pose a problem is that migration's crosscurrents have left heavy poverty concentrations in cities that offer diminishing job opportunities.

Such poverty concentrations are doubly disturbing in light of the older cities' long-term job losses in manufacturing. Historically, manufacturing jobs were the main avenue for employing and building skills for large numbers of initially untrained workers. But as manufacturing jobs have disappeared, and despite a partial replacement by white-collar jobs, this "upgrading" function has all but vanished in the older cities.

The regional decentralization of manufacturing jobs over the past 15 years has far outpaced population shifts. Between 1966 and the economy's cyclical peak in 1979, the Northeast quadrant lost 788,000 manufacturing jobs. Over the same interval, the rest of the Nation added more than 2.3 million. The result has been that traditional regional specializations have been almost entirely erased, leaving a national distribution of industrial employment that is increasingly uniform relative to population.

It is this rapid blurring of century-old regional roles that perhaps best defines the regional revolution. By one reading, the reasons for the change are of interest not only for their urban policy implications, but also because of their relevance to U.S. prospects within the world economy.

At the same time, the economic dislocations have diminished the tax base and revenue-sharing potential of many Northeastern and Midwestern cities, reducing their ability to provide services to an increasingly dependent population.

III

THE FISCAL FACTOR AND THE BANKRUPTCY ISSUE

In addition to its adverse effects on people, economic realignments have dramatically impacted State and local government finances. Slow growth in the older regions forces their governments to cut back the growth -- if not the absolute level -- of public services. The fiscal issue is most sharply defined in the older cities of the Manufacturing Belt. Retrenchment hits them hardest, making further city financial emergencies likely.

The economic realignments which have been occurring for the past 20 years have been accompaned by significant changes in the American fiscal system. First, between 1954-1979, the Federal presence in the public sector increased, while the role of State and local government declined. In this period, the Federal domestic expenditures from its own funds increased as a percent of the total public sector from 45.5 percent to 57.7 percent, while the percent of both State and local government own-source expenditures declined. State government expenditures as a percent of total public sector expenditure declined from 25.5 percent to 23.8 percent, while local government expenditures declined dramatically from 29 percent to 18.3 percent.

Second, the proportion of expenditures for health, education and welfare have increased rapidly at all levels of government.

Third, during the past two decades, Federal intergovernmental grants have increased significantly and have played an increasingly important role in State and local government budgets. Between 1955-1979 Federal grants to State and local governments increased from $3.2 to $82.9 billion per year. As a result, revenue from the Federal Government represented 30.9 percent of State and local government own-source receipts in 1979 as compared to 11.8 percent in 1955.

In the next decade these trends are likely to be altered by the overriding national concern to reduce inflation by balancing the Federal budget and by a possible realignment of national priorities from increasing outlays for domestic social programs to increasing defense outlays. The impact on the finances of many State and local governments -- most notably those in the Northeast and Midwest -- is likely to be traumatic.

As discussed above, the by-product of a declining economic base has been a reduced tax base in many Northeast and Midwest cities, fewer jobs, an increasingly dependent population and increased reliance on Federal assistance.

In addition, if the national economy in the 1980's is buffeted by higher rates of unemployment and lower productivity growth than in the 1970's, it will work to the detriment of the State and local government financial stability.

A factor that was responsible for the relative fiscal stability of State and local governments in the 1970's was the massive inflow of direct Federal aid. However, the rapid increase in these funds has peaked. Between 1970 and 1978, the average annual increase in Federal inter-governmental assistance was almost 16 percent. The projections for 1979-1981 are for annual increases averaging under 5 percent.

Some local expenditure cutbacks and deferrals which began in the 1970's and were successful in warding off financial problems can no longer be sustained if services are to be maintained. In particular, postponing capital expenditures was a frequently used means of paring expenditures. Gross capital expenditures have fallen from 29 percent of total State and local government spending in 1965 to 14 percent in 1977. However, capital replacements cannot be put off indefinitely, and the slowdowns in capital spending are likely to increase the burdens of capital obsolescence in some cities.

These factors combine to paint a less than optimistic outlook for many city governments and some states in the 1980's.

Fiscal Response to Decline

In the wake of the regional revolution, the formerly rich states are attempting to bring their fiscal activities into line with their relatively lower levels of tax revenues. As a state like New York attempts to bring its per capita expenditures (40 percent above the U.S. average) into line with its per capita income (4 percent above the U.S. average), the central issue becomes how to maintain the level of essential public services at a time of budget constraint.

For New York and other long industrialized states, the retrenchment process will likely mean a period of public sector atrophy. Governments will probably not cut back service levels in the absolute. But they may spend just enough to keep real per capita spending roughly constant. In time, and depending on the fiscal response to growth elsewhere, the rest of the country may reach comparable levels of public expenditures.

Still, the adjustment process will be slow, and it will be complicated by a number of factors. For one thing, the psychological barriers to retrenchment may almost equal the resistance to further tax increases. It is worth noting, for example, that of the 14 states to pass some form of tax limitation between 1978 and mid-1980, 13 were located in the South and West, regions already identified with lower taxes than the older regions. In other words, the region with a stagnant revenue base accounted for only one (Indiana) of the 14 states to clamp a lid on taxes.

Moreover, many Northern states are characterized by highly decentralized fiscal systems. Hence, it is difficult for State governments to plan for or control the aggregate level of State and local government spending and taxation. And the barriers to retrenchment are compounded at the local level by the strength of public employee unions, the presence of fixed debt and pension commitments, and a characteristic backlog of projects to bolster aging and deteriorating urban infrastructure.

Retrenchment in the older regions will proceed in a highly uneven and haphazard fashion, hitting some jurisdictions (especially older cities) hard, and others not at all. More specifically, and assuming no major new Federal initiatives, the medium-range picture in the Manufacturing Belt is likely to include the following fiscal elements:

- Further public employee layoffs.
- A reduction in relative (though not absolute) tax burdens as austerity programs begin to take hold.
- The de-emphasis of redistributive programs. Social service program expansions may take a back seat to public employee compensation and capital maintenance.
- A continued deterioration of public facilities, as high interest rates, inflation, reduced Federal aid, and pressure for current spending all push some governments to "defer" capital construction maintenance and renovation.
- Either default or service interruptions by some localities, most but not all of them large cities in the North.

The Fiscal Response to Growth

The growing regions will also face fiscal adjustment problems. The South and Southwest still have much urban and, particularly, rural poverty. In addition, growth creates pressure to expand infrastructure, improve school and health systems, deal with water shortages and environmental problems, and control land use. Additionally, expenditures could well be spurred by efforts to increase public sector wages in the South.

Yet, on balance, the younger regions seem to have better equipped themselves than most long industrialized states to deal with their problems. In particular, one reason business climates favor states in younger regions is that fiscal systems do. Fiscal arrangements in many Southern and Western states are not only more pro-business, however. They are also more "pro city." For example, older cities have long-frozen boundaries which State governments have not been prone to change, and which allow the surburbs to be largely immune to the central city problems of decline. In the South and West, however, many cities have succeeded in repeatedly shifting their borders outward since 1945, thus combining the strengths and weaknesses of inner city and suburban city. The younger cities of the South and West cover much larger land areas than do older cities. As a result, younger cities have equipped themselves for better protection from the fiscal and social impacts of spatial decentralization or "suburbanization."

However, there are problems ahead for Southern states, too. If increases in spending come in the form of a catch-up in average wages, expenditures could rise more rapidly than public service levels. Employment levels, relative to population, are already higher in Southern than Northern states, as are levels of per capita debt.

The Bankruptcy Issue

Further, the Federal Government does not have a consistent or articulated policy to assist, or not to assist, fiscally distressed cities. Such a policy will be increasingly important in the years to come because financial emergencies -- if not outright defaults -- may lie ahead for some older cities.

What is a constructive Federal response to such crises? Dealing with New York City on an ad hoc basis was understandable. There had been little reason to be concerned with municipal default since the Depression and in many respects the New York City crisis of

1975 was a special case. But how many special cases will occur before a consistent Federal policy response is deemed necessary?

A preliminary issue is whether city financial emergencies are more properly the concern of the states than of the Federal Government. Some would argue that the problems of New York City, Cleveland or Wayne County are primarily the responsibilities of the States of New York, Ohio and Michigan. From that premise, emergency Federal assistance should come only as a last, desperate resort -- if at all -- and only after state assistance has been exhausted.

By extension, an extreme policy option would be to make it clear that the Federal Government will *not* rescue cities from default, no matter how severe the emergency. If local and State governments were convinced that a borrower of last resort was not available, their financial practices might become more conservative, and their borrowing practices more risk-averse.

There is, however, logic in the argument regarding the responsibility and the Federal Government's accountability for city government financial conditions. State officials contend that a combination of local autonomy, Federal mandates, and direct Federal-local grants have ended their ability to control fiscal excesses. For their part, municipal administrators might contend that, in an emergency, little can be expected from a State government that failed to modernize city fiscal arrangements in the first place.

IV

A POLICY FRAMEWORK

In a world of increasingly competing economies -- many young growers and a few notably older and recently revitalized -- the United States must pursue a policy goal of balanced, non-inflationary growth. Non-inflationary growth is essential to real income growth and central to the resolution of the fiscal problems of many of the Nation's cities.

The single most important thing that the Federal Government can do to meet the needs of State and local governments is to stabilize the national economy and return it to a path of stable economic growth. Recession reduces the revenues of local governments and at the same time increases the demand for public services. When recession is coupled with rapid inflation, the results are even more dangerous to the financial health of local governments.

There is no conflict between a national economic growth strategy and the economic needs of the Nation's people and regions, nor between the people-to-jobs or jobs-to-people approach. (The people-to-jobs approach encompasses programs to assist people who seek relocation to regions offering economic opportunities, training people for new jobs when they have been displaced, and training the underskilled and unskilled so they may enter the labor market in growth industries. The jobs-to-people approach includes government programs and incentives for job-creation in declining cities and efforts to revitalize the Nation's central cities). The goal of faster economic growth enforces the logic of a policy strategy that utilizes the best of the people-to-jobs and jobs-to-people worlds. If urban problems are to be ameliorated, there must be a carefully structured program which balances these two approaches. While more emphasis is needed on human capital investment, which implies a shift from present place-oriented urban strategy to a more people-oriented approach, one approach must not necessarily be at the expense of the other.

Deteriorating conditions in major urban areas do call in question a policy strategy that has emphasized in-place aid, although some programs -- such as the Urban Development Action Grants -- have kept conditions from being worse than they are.

Key barriers to the mobility needed for people-to-jobs strategy are posed by the administration and structure of both public assistance and unemployment compensation. The pattern of interstate differences in welfare levels sets up locational incentives that some contend have the effect of tying the jobless to areas offering them diminishing opportunities.

As welfare programs are now administered, a move from one state to another means a loss of benefits, with no automatic resumption. The same thing goes for Comprehensive Employment and Training Act (CETA) participation, which is locally administered. "Mobilizing" program entitlements could be a step toward providing the unemployed and under- employed choices other Americans have.

Beyond reducing policy barriers to mobility, the Federal Government can also take positive steps to promote better access to job opportunities. Information barriers are clearly a major reason for high unemployment rates in older cities. A program on the order of the Job Search and Relocation Assistance Pilot Project could be linked to CETA and the Trade Adjustment Assistance (TAA) programs, bolstered by both relocation grants and non-cash resettlement assistance of the sort already widely used in Northern Europe.

U.S. training programs lag behind the various European and Japanese programs. In all industrialized countries the availability of a constantly upgraded labor force is considered essential; however, approaches to its achievement vary considerably. The West Germans, since 1963, have established the right of every German citizen -- whether employed or unemployed -- to as much as two years retraining for a higher skill, with all costs paid, plus a stipend which is inversely related to the last income. In the lower income brackets, the stipend is almost 100 percent of the last salary. Thus, a low wage employee loses little in upgrading his or her skills and in improving his or her productivity. Those needing the most help, but with the most to gain, are the low paid workers. Hence, they are subsidized greatly. But the economy gains by their becoming higher skilled workers. (Scandinavian countries as well as France and Britain all now have similar programs in place.)

In Japan, the policy of continuously upgrading and retraining workers has been carried out primarily within large companies. Evidence indicates that a philosophy of "investment in the labor force" has had productive results. For their part, workers seem generally receptive to innovation and labor saving techniques, because they know that: (1) they will be retrained and upgraded for more demanding jobs and, (2) that innovation will enhance the competitive positions of their employers, which is likely to lead to more job opportunities.

If there is little doubt that a policy strategy of balanced, non-inflationary growth and investment in human capital would benefit all concerned, there is also little doubt that the implementation of such policies is complicated by the state of intergovernmental relations.

During the 1960's the Federal Government moved into areas such as education and law enforcement to fill what were perceived to be public needs unmet by the states and localities. The result has been a burgeoning of programs that now entails at least 500 kinds of narrow categorical grants for such things as settling disputes among citizens and rat control.

At a minimum a case can be made for consolidation of these special-purpose grant programs that frequently create inefficiency and distort spending priorities at all levels of government.

Furthermore, there has been an ambivalence at the Federal level about the "proper" role of State governments in local government finances. On the one hand, there are frequent calls for greater State government responsibility, while on the other hand, since 1970 much of the increase in grants-in-aid has gone directly to local governments, bypassing the states. Local governments are creations of their states and yet frequently turn to Washington for assistance before going to their state capital. Governors have been urging fewer Federal regulations and a more prominent role for states in the state and local system. The Federal Government should seize this opportunity to give states that chance. But first, the

Federal Government should have a clear idea of what is expected of the states in terms of local assistance and how these objectives can be achieved.

An even more fundamental issue is frequently raised. It is at least possible that the Nation is too diverse for highly centralized government programs, particularly since both population and political centers have, as has been emphasized, become increasingly dispersed.

Recent calls for the establishment of a commission on the role of the various levels of government are based, at least in part, on these considerations. What is clear is that efforts must be undertaken at all levels of government to rationalize programs, to eliminate program redundancy, to encourage efficiency, and to more adequately define governmental roles.

Just as important will be a continued and growing emphasis upon market-based solutions to the problem of structural unemployment. This has already begun to happen. For example, conventional approaches to fostering urban revitalization have changed markedly from the 1960's and early 1970's. During this earlier period the public's role was generally to acquire and clear sites for private redevelopment. The problem was that public development agencies sometimes overestimated the possible returns to private development of the cleared sites. As a result, existing businesses and households were displaced, and public dollars were spent without the realization of the hoped for redevelopment.

In response to these problems, the Federal and local governments now generally employ an approach which links public investment in renewal with commitments by private developers, investors and businesses.

Balanced economic growth, investment in human capital, a better understanding of the role of the various levels of government, and a continuing, growing emphasis upon the role of the private sector in reducing structural unemployment are all not only essential to the health and vitality of the state and local sector, but also they are ideally complementary and mutually reinforcing. The pursuit of any one of these policy goals will contribute to the attainment of the others.

Policy Considerations

State and local government finances are heavily impacted by the performance of the national economy. It is for this reason that the single most important thing that the Federal Government can do to meet the needs of State and local government is to provide an environment that is congenial to stable economic growth.

While a strongly growing economy is needed to create jobs for the unemployed, targeted training and employment policies which emphasize private sector employment are also needed. Public sector efforts should be fully coordinated with the needs of and the opportunities provided by the private sector.

As stated in the Human Resources and Demographics section of the Special Study on Economic Change, this policy is not to suggest that adjustment policy linked with growth industries is the only course. It is to suggest, however, that policy should concentrate on, and emphasize, the merits of a national goal to best utilize resources in the growth industries of the Nation.

Another consideration is the development of growth zones in central cities utilizing the cooperation of business, labor and government to provide relatively free existence of enterprise with relaxation of some tax and regulatory laws, known as the "enterprise zone" concept. The concept would require consideration of removing obstacles to the establishment of new businesses in depressed areas through reductions in property taxes and capital gains rates, but cutting red tape, and setting up free trade zones.

A bill now before Congress would set up a high-level bipartisan Commission on More Effective Government, patterned after the first Hoover Commission of 1947, with members from both public and private life. Its broad mandate calls for the Commission to develop a blueprint for better government in the United States, to set in motion processes by which the Federal Government can more effectively and responsively serve the people for whom it was created. The Commission is also required to study the extent to which Federal, State and local governments are contributing to the well-being of the people, focussing particularly on the way these various units of government interrelate, and to recommend changes designed to improve the quality of all government service.

Policy considerations to increase opportunities in urban areas include:

- Targeted incentives to private sector employees -- particularly in small business -- to effectively train and hire the structurally unemployed.
- The increase of investment tax credits for the rehabilitation of industrial and commercial structures to help revitalize urban centers.

- Modifications of the investment tax credit to supplement the simplified cost recovery system in order to encourage additional investment in plant and equipment.
- Continued emphasis on underlying issues which result in minority unemployment, such as inadequate basic education, training, knowledge of employment opportunities, and other labor market difficulties.
- Assistance in the adjustment of workers displaced because of technological change or international competition, with direction toward training, retraining, employment and re-employment in growth industries, rather than exclusively as supplementary unemployment insurance.
- Encouragement of enterprise zones. Consideration might be given to removing obstacles to the establishment of new businesses in depressed areas through reductions in property taxes and capital gains rates, but cutting red tape, and setting up free trade zones.

Most of all, however the best urban policy is a policy which leads to strong national economic growth.

Contents of Volume

The following is a list of technical study titles and authors of papers which appear in the final printed volume of the State and Local Government section.

A. State and Local Government Finances and the Changing National Economy. (Roy Bahl, Metropolitan studies program, the Maxwell School of Citizenship and Public Affairs, Syracuse University)

B. Government Policy and Industrial Location in the United States. (John Rees, The University of Texas at Dallas)

The State and Local Government section of the Special Study on Economic Change, Joint Economic Committee, is one of 10 sections of the SSEC. Orders for this study may be placed by contacting:

Joint Economic Committee
Room G-133
Dirksen Senate Office Building
Washington, D.C. 20510
Telephone: (202) 224-5321

Social Security and Pensions:

Programs of Equity and Security

Joint Economic Committee

Special Study on Economic Change

A staff study

October 1980

The Joint Economic Committee's Special Study on Economic Change (SSEC) was inaugurated under the leadership of then Chairman Richard Bolling (D.-Mo.) and Vice Chairman Hubert H. Humphrey (D.-Minn.), together with Senator Jacob K. Javits (R.- N.Y.), ranking Minority Member.

The study progressed through Mr. Bolling's chairmanship and into the leadership of Senator Lloyd Bentsen (D.-Tex.), chairman; and Congressman Clarence J. Brown (R.-Oh.), ranking Minority Member. The goal of the SSEC is to chart the major changes in the economy and to analyze their implications for policymakers.

JOINT ECONOMIC COMMITTEE

LLOYD BENTSEN, Texas, *Chairman*
RICHARD BOLLING, Missouri, *Vice Chairman*

SENATE

WILLIAM PROXMIRE, Wisconsin
ABRAHAM RIBICOFF, Connecticut
EDWARD M. KENNEDY, Massachusetts
GEORGE McGOVERN, South Dakota
PAUL S. SARBANES, Maryland
JACOB K. JAVITS, New York
WILLIAM V. ROTH, Jr., Delaware
JAMES A. McCLURE, Idaho
ROGER W. JEPSEN, Iowa

HOUSE OF REPRESENTATIVES

HENRY S. REUSS, Wisconsin
WILLIAM S. MOORHEAD, Pennsylvania
LEE H. HAMILTON, Indiana
GILLIS W. LONG, Louisiana
PARREN J. MITCHELL, Maryland
CLARENCE J. BROWN, Ohio
MARGARET M. HECKLER, Massachusetts
JOHN H. ROUSELOT, California
CHALMERS P. WYLIE, Ohio

JOHN M. ALBERTINE, *Executive Director*
LOUIS C. KRAUTHOFF II, *Assistant Director-Director, SSEC*
RICHARD F. KAUFMAN, *Assistant Director-General Counsel*
CHARLES H. BRADFORD, *Minority Counsel*

Table of Contents

CHAIRMAN'S INTRODUCTION i
Senator Lloyd Bentsen

RANKING MINORITY MEMBER'S INTRODUCTION ... iv
Rep. Clarence J. Brown

I. INTRODUCTION 1

II. MAJOR RETIREMENT INCOME PROGRAMS 5

III. PENSIONS AND THE ECONOMY 19

IV. POLICY IMPLICATIONS 31

CHAIRMAN'S INTRODUCTION
Senator Lloyd Bentsen
Chairman, Joint Economic Committee

Inflation, unemployment and lagging productivity threaten the adequacy and the security of retirement benefits in America. This is one of the reasons why it is necessary at this stage in our Nation's history to adopt policies which can restore strength to the economy. If we revitalize our economy, we will have taken the longest step toward restoring faith in our retirement programs.

The following staff study from the Special Study on Economic Change suggests several policy considerations, and all are supportive of the primary pension goal -- to assure that all workers, their survivors and dependents receive secure, adequate and equitable retirement benefits from Social Security, private pension plans or personal savings. The study places top priority on the development of an investment-based economic growth policy.

The study details how private and some public pension plans play an important role in capital formation, since the assets of these funds provide an enormous pool for investment. The growth of assets of major private pension programs in the United States is a striking example. In 1960, these assets amounted to $52 billion; by

1970 they were $138.2 billion, and by 1979 over $320 billion -- more than a six-fold increase in two decades. Policies to enhance these funds and to create more individual retirement plans through increased savings can result in greater economic dividends for the whole country.

While a strong economy adds to retirement funds, a weak economy subtracts. The effects of unemployment on Social Security and pension plans are profound. Unemployment instantly reduces contributions to Social Security and pension plans, and periods of heavy and prolonged unemployment seriously decrease revenues. For example, for every one million workers laid off for one month in 1980, the Social Security fund loses about $100 million in contributions. Unemployment not only means lost revenues, but also increased benefit payments because some people who become unemployed take early retirement.

Americans have seen the amount of the Nation's resources devoted to retirement, disability and survivor benefits increased four times in the past 30 years -- from 2 percent of GNP in 1950 to 8 percent in 1979. Stronger economic growth would have kept that rate closer to 2 percent, and for each percent growth we lose in the future, the greater the burden will become.

In addition to economic factors, demographic changes have strongly influenced the growth of Social Security and retirement benefits. We are living longer and retiring earlier. Since World War II, the average length of retirement has risen nearly 35 percent. In the future, as the baby boom creates the seniors boom, there will be fewer workers to support many more retired persons. The age 65 and over population is expected to increase from about 25 million in 1980 to nearly 32 million by 2000. Beneficiaries of Social Security and retirement plans will grow even faster, from 35 million in 1979 to 47 million in 2000.

These changes in our population make it imperative that today's and tomorrow's workers be better equipped and better skilled to produce more. When more goods and services are produced with fewer worker hours, prices are stabilized, real earnings increased, and more resources made available for economic and social goals -- one of the greatest of which is good retirement income.

But if the rate of economic growth declines, then the share of national income required to support the elderly increases. It is in that circumstance that choices become more difficult and consideration of trade-offs begin -- trade-offs between young and old, between unemployment benefits and retirement benefits, and between present wages and current pensions. Action today can mitigate those potential trade-offs of tomorrow.

American tradition has developed a bond between generations. A healthy, expanding economy offers the best assurance that future working generations will be able to deliver on their inherited commitments to provide sound retirement and Social Security benefits for the workers of yesterday.

Ranking Minority Member's Introduction
CONGRESSMAN CLARENCE J. BROWN

The retirement income systems in the United States have become an integral part of our social and economic fabric. It is a high national priority to assure that these systems continue to serve their basic purpose of providing adequate income and peace of mind for our senior citizens. It is also important to view these retirement systems in terms of their overall interaction with the economy and as part of a larger growth strategy.

In 1950 the total of retirement, disability and survivor benefits accounted for about 2 percent of the gross national product (GNP). In 1979 these benefits comprised almost 8 percent of the GNP. The Social Security OASDI program, which is now the largest economic and social program of the Federal Government, covers about 114 million persons. Three-fifths of the Nation's elderly persons derive more than 50 percent of their income from Social Security. In 1978 the assets of private pension plans amounted to $321 billion. If these assets grow at just 4 percent, compound rate, by 1985 the total value of these resources will be $422 billion, a sizable reserve of investment capital.

Unfortunately, a number of factors are jeopardizing our retirement income system: Inflation, unemployment and slow growth. Demographic factors such as declining birth rates, increasing life expectancy and the aging of the post-War "baby boom" will put increasing strains on the ability of our systems to pay benefits. Greater participation in the workforce by women as well as the trend toward early retirement will also test the retirement income programs.

How these factors develop and how we react to the challenges of the retirement systems will greatly affect the economy of this country. This staff study on Social Security and pensions suggests possible responses to these challenges, including greater emphasis on private pensions and greater earnings and enlarged individual savings to alleviate the burden and dependency on the pay-as-you-go Social Security system. Advance-funded private pensions plans and individual savings not only assure a tangible reserve from which to provide future retirement income, but also create a pool of investment capital which can help combat inflation, increase economic growth and spur productivity gains.

The fundamental solution to adequate funding of our public and private pension programs is strong economic growth. Since 1950 the average annual real growth of the U.S. economy in real terms has been 3.6 percent. If the United States had grown an average of 1.5 percentage points faster in real terms each year since 1950 -- at the 5.1 percent rate that our industrial competitors have been growing -- our current dollar GNP would now be $3.75 trillion, instead of the $2.4 trillion registered in 1979. Supply-side tax cuts could easily have generated this kind of growth.

With a $3.75 trillion economy, incomes would be 50 percent higher than at present. Federal revenues this year would be more than $200 billion higher. This would be enough to provide for a balanced budget, major increases in health, education and social spending, and unquestioned military preeminence, with enough left over to put the Social Security System on a sound, solvent footing. And this could have been accomplished while reducing payroll and income taxes instead of raising them. Economic growth is the key.

As the population continues to grow older in the years ahead, retirement income policy will become even more important. Treatment of pensions by the JEC's Special Study on Economic Change contributes to an informed discussion of many challenging issues on this subject and will assist in the development of a long-term, national policy on retirement income.

Special Study on Economic Change

LOUIS C. KRAUTHOFF II, *Director*
GEORGE D. KRUMBHAAR, JR., *General Counsel*
BILL R. MADDOX, *Editor*

SOCIAL SECURITY AND PENSIONS:

Programs of Equity and Security

Prepared under the direction of:

DOUGLAS N. ROSS
Senior Economist, SSEC

And

WILLIAM C. BIRDSALL
Professor, School of Social Work
University of Michigan

Contributing Editor:

EVELYN COOPER, *SSEC*

SOCIAL SECURITY AND PENSIONS:
Programs of Equity and Security

I
INTRODUCTION

Retirement income systems have become an integral part of the social and economic fabric of the United States. In the past 30 years, resources devoted to pensions in America have quadrupled. In 1950, the total retirement, disability and survivor benefits accounted for about 2 percent of gross national product (GNP); by 1979, these benefits claimed almost 8 percent of GNP. As the population ages, retirement benefits from Social Security and from private and public pension plans will become increasingly important to the economy.

Current slow economic growth coupled with demographic changes pose problems for all retirement income systems. Inflation and unemployment threaten the adequacy and even the security of benefits. An aging population -- more older people living longer -- strains the resources of Social Security and of pension plans. Moreover, the lack of coordination between various retirement systems results in inequities among pension recipients.

Policy decisions on current pension issues -- coverage, equity, security, financing and retirement age -- must be considered in a broad long-term economic context since they are likely to have significant effects on the economy for decades to come.

This staff study provides an overview of retirement income policies and programs in relation to the economy and to the broad economic issues of inflation, saving, and capital formation. The study considers the impact of demographic shifts and retirement patterns on pensions, on Social Security, and on productivity. It also projects the increasing costs of public and private pension plans. Finally, the study suggests some implications for future policy in light of recent and current economic, social and demographic changes.

A number of themes emerge from the study, all of which document the growing importance of public and private retirement systems in the economy:

(1) A high inflation rate, low economic growth and unemployment greatly exacerbate the problems of financing retirement income systems. Predicted long-term pension problems have arrived well ahead of schedule due to inflation, slow growth and low productivity. The impact of inflation is critically important in programs such as Social Security that adjust benefit levels to changes in consumer prices or the cost of living. While these adjustments are essential to guarantee the real level of benefits, it is possible that they could outpace wage increases and create disincentives to work.

Unemployment instantly reduces contributions to Social Security and to pension plans, and periods of heavy and long-lasting unemployment seriously increase revenue losses. For example, for every one million workers laid off for one month in 1980, the Social Security funds would lose about $100 million in contributions. Moreover, unemployment means increased total benefit payments as some unemployed persons opt for early retirement.

(2) The number of aged, retired and disabled persons is growing more rapidly than the number of those who work and who bear the burden of rising retirement benefits. Thus the compact between generations -- the basis of all retirement systems -- is being strained. For example, under the present pay-as-you-go system of Social Security, taxes of current workers back the checks that are sent to retirees, their dependents and survivors. Today, there are about three workers paying taxes into the Social Security system for every person who is drawing benefits from it; by 2025, the ratio of contributors to beneficiaries will be two to one. (This ratio, of course, is smaller than the ratio of the working age population to the population age 65 and over, which is now 5.4 to 1.) Without jeopardizing programs aimed at comprehensive and adequate old-age security, policymakers and legislators must consider their future cost implication. In addition, an examination of possible disincentives to productivity such as mandatory retirement age or limit on earnings is necessary if economic growth is to be achieved.

(3) In terms of size and impact on the economy, Social Security is by far the most important retirement income program because:

• Social Security benefit payments in fiscal year 1979 amounted to $101 billion paid out to a total of 35 million people, including retirees and their dependents, disabled workers and their dependents, and survivors.

• 114 million workers paid Social Security payroll taxes in 1979.

• Social insurance taxes and contributions accounted for an estimated 30 percent of total Federal revenues in 1979.

- More than half of all families in the United States now pay more in Social Security taxes than in income taxes.

The Social Security system now is faced with both an immediate funding problem and the possibility of a long-run funding problem. Costs of indexed pension benefits -- benefits that rise with inflation -- have increased much more rapidly than anticipated in the most recent decade due to inflation, and benefits will continue to soar as the population ages. Changes in Social Security must be considered in this context, but concern with costs must not be allowed to override or to obscure the basic objectives of the program. Public policy has a stake in maintaining the level of real benefits, in terms of adequacy and equity.

At the same time, Social Security has an impact on private saving, and thus, on capital formation. Decisions about changes in the Social Security system, therefore, carry major implications for economic growth and should be a part of the government's unified and coordinated approach to the range of problems which beset the stagflation economy.

(4) A low growth in State and local Government employment and an increasing proportion of retirees increases the ratio of benefits to payroll and exacerbates the financial problems for the 6,630 State and local Government pension plans that affect 13 million current participants. While the outlook for State and local pension plans was somewhat bleak in 1975, certain funding changes were made (such as increasing contributions from 15 to 19 percent of total payroll) that should help alleviate major problems.

(5) Retirement income plans in the private sector are an important source of income for retirees and other beneficiaries.

Private pensions cover more than 30 million persons and private plans pay benefits to some 7.5 million retirees.

In general, private pension benefits equal about 20 to 25 percent of an individual's preretirement earnings. However, inflation is rapidly eroding the *real value* of private pensions which generally are not indexed to the cost of living.

(6) About 60 percent of about a half million active corporate pension, profit-sharing, and stock bonus plans covering about 30 percent or more of all participants, are "integrated", i.e., their benefit formulas or contribution levels are reduced to take account of Social Security benefits or taxes paid by the employer. The choices of whether to integrate private and public pension benefits and, if so, what integration formulas to use, are critical to an equitable and secure pension system.

(7) The assets accumulated in pension funds provide an important capital source for productive enterprise. For example:

- Assets of private pension plans in 1978 amounted to over $321 billion. These assets represented about 27 percent of GNP, or more than double their percentage of GNP in 1950. By 1985 -- if assets grow at a 4 percent compound rate -- the total value of these stocks, bonds, real estate and other investments will amount to $422 billion.
- Federal civilian retirement systems in 1978 had accumulated assets of $57.7 billion which are invested in government securities.
- State and local government pension systems in 1978 had about $142.6 billion in assets, largely invested in private securities. If assets grow at a 4 percent compound rate, the total will be $187.7 billion in 1985.

Employees of American business, together with public employees and school and college teachers -- through their pension funds -- own about 35 percent of business' outstanding equity capital. In the 1980's, control of pension assets could become a major issue, with important ramifications for regional and sectoral economic growth.

II

MAJOR RETIREMENT INCOME PROGRAMS

Public policy must, of course, consider the personal and social goals related to standards of living for the aged as well as the costs of retirement benefits.

The goal of pensions, whether private or public, is to provide adequate income when earned income diminishes at older ages. There are different concepts of retirement income adequacy: Absolute adequacy is related to a fixed standard of need, such as the official poverty thresholds; relative adequacy relates the pension to one's previous income and is measured by the replacement rate, or the benefit as a fraction of preretirement earnings. Another concern is individual equity, the idea that benefits should bear a close relationship to preretirement earnings. Yet another aim is fairness or equitable treatment among various groups in the population.

Clearly, no one of these goals has had overriding priority in the history of U.S. pension legislation. It is a history of compromise, not just among goals, but also among the kinds of institutions and interventions society should adopt in pursuing these goals.

The possible means to attain pension policy goals are varied. They include:

(1) The cash *demogrant* which is a universal government pension given to *all* persons beyond a specific age, regardless of income. This program does not exist in the United States, though it does in some other countries.

(2) A *means-tested* system for the aged by which a pension is given only on the basis of proven need and the amount of the pension is related to the degree of need. Supplemental Security Income (SSI) is an example.

(3) An *earnings-related public system* in which the contribution to the retirement system and the amount of the pension that accrues are both related to the individual's earnings. The Old Age Insurance (OAI) component of the Social Security system is an example.

(4) *Regulation* by which a government mandates private pensions or determines certain standards that private pension contracts must meet. The United States does not require employers to provide pensions as do some countries, but it regulates private pensions under the Employee Retirement Income Security Act of 1974 (ERISA), and provides some insurance under the Pension Benefit Guaranty Corporation (PBGC).

(5) *Incentives* provided by a government, particularly under the taxing power, to encourage the establishment of pension plans or particular provisions in the plans. In the United States practically all private pension plans now enjoy favorable tax treatment.

Retirement programs were not serious concerns for government or for private industry until the Great Depression of 1929. At that time, less than 15 percent of the labor force received pensions provided by Federal, State and local governments and by a few private firms. The only Federal Government policy to encourage private pensions was a tax incentive initiated in 1921. The economic and social problems of the Depression, with mass unemployment and loss of life savings, awakened the country to the need for more systematic provisions of income support for the aged. The result was the passage, in 1935, of the Social Security Act which initiated the system of national retirement insurance. This program, modest at the outset, has grown to the point where it affects the life planning of almost all citizens and the lives of the elderly in particular.

Almost all workers in America are now covered by Social Security or by one or more of over 500,000 separate pension plans provided by Federal, State and local governments, and by private corporations. Social Security covers over 90 percent of all paid employment, including almost all private sector employees and a majority of State and local government employees. There are separate public pension programs for Federal military personnel, Federal civilian employees, and State and local employees, and separate private pension plans established by private sector employers. These plans, developed at different times to meet different needs, vary in size and in provisions for benefit eligibility, retirement ages, contributions, benefit levels and financial solvency, and are subject to a complex legal and regulatory environment. While they provide an impressive, if unequal, array of retirement benefits, they do not constitute a unified comprehensive system of retirement income for all workers.

The Social Security System

Historical Growth -- The 1935 Social Security Act inaugurated Old Age Insurance (OAI), the earnings-related public retirement system; and Old Age Assistance (OAA), a means-tested program for the aged. OAI was initially designed to provide a floor of economic protection for elderly persons, without making benefits so high that savings and investment and private employer-employee plans would be discouraged. It began as a simple plan providing monthly cash benefits for all workers in commerce and industry 65 years of age and older. Under the original pension formula, replacement rates were lower for higher-wage earners and higher for lower-wage earners, as they still are today. The social adequacy goal was a strong feature of even that first benefit formula. This goal also very much motivated the important 1939 amendments to the Social Security Act which initiated benefits for dependents of retired workers and added a new category of protection, Survivors' Insurance (SI).

Amendments to Social Security (OASI) in 1950 and subsequent additions during the decade of the fifties extended coverage to many groups. Social Security now covers nine out of 10 American workers, including the self-employed, professionals, farm employees, most clergy, and a majority of State and local government employees.

The Social Security System also grew in "risks" covered by its disability (1956) and health (1965) insurance amendments. Dependents' benefits were liberalized in terms of amounts, eligibility, and time and length of receipt. Early retirement was allowed at reduced benefits.

Since 1951, when benefits were sharply increased, the benefit formula has been regularly amended to keep benefits roughly constant in terms of purchasing power. The benefit and financing provisions of the Social Security Act were made "dynamic" in 1972; that is, pension benefits were linked to cost of living so that Congress could avoid the necessity -- and retired persons the uncertainty -- of ad hoc benefit adjustments. This was corrected in the 1977 Amendments to the Social Security Act which were aimed at maintaining the ratio of Social Security benefits to preretirement earnings at roughly constant levels through time, regardless of inflation. The principle is that each generation of future retirees should have roughly the same proportion of preretirement earnings replaced by Social Security benefits.

OASDI -- The Old Age, Survivors' and Disability Insurance (OASDI) component of Social Security, which evolved from Old Age Insurance (with Disability Insurance added in 1956), is now the largest economic and social program of the Federal Government, covering about 114 million persons in 1980. This includes nearly all regularly employed and self-employed workers outside of government, as well as about 70 percent of the 13 million State and local government employees covered under voluntary agreements between State and local government units and the Social Security Administration.

Three-fifths of the Nation's elderly persons derive more than 50 percent of their income from Social Security, but Social Security alone does not provide an adequate income to beneficiaries. In 1977, the average monthly benefit for the 17.8 million retired workers was $243, and for 4.1 million aged widows and widowers the average was $222. By end of June 1980, the average monthly benefit for the 19.2 million retired workers had risen to $338, and the average amount for the 4.2 million widows and widowers over 60 was $310 per month. In 1980, the OASI components of Social Security are expected to provide income support to 19.3 million retired workers and their 11.6 million dependents and survivors, at a total benefit cost of $99 billion.

The Social Security Administration estimates that the wage replacement rate -- the relationship between gross preretirement earnings and postretirement income -- for persons with average earnings retiring at age 65, will be 42 percent of final year earnings for a single worker and 63 percent for an aged couple after 1981.

Social Security is funded on a pay-as-you-go basis, that is, current contributions or taxes are used to pay current benefits so that there is no significant accumulation of assets in the trust funds. Social Security is financed equally by employer and employee taxes paid into the Old Age and Survivors' Insurance (OASI) and Disability Insurance (DI) Trust Funds. Self-employed persons contribute a higher percentage of their net income than employed persons. (The Social Security system also includes Medicare, initiated in 1965, which provides hospital and supplementary medical insurance to the elderly with a separate trust fund for hospital insurance.) Social Security taxes are levied at the same rate on both employees and employers on annual earnings up to a certain maximum amount. The Social Security Amendments of 1977 raised this taxable wage base so that approximately 90 percent of payroll is subject to Social Security taxes. This ceiling on covered earnings increased from $22,900 in 1979 to $25,900 in 1980 and will rise to $29,700 in 1981. Thereafter, the maximum amount upon which workers pay and for which they receive benefit credits rises automatically with increases in average earnings. These figures are in sharp contrast to the maximum taxable wage base of $7,800 in 1971 and $9,000 in 1972.

Social Security is one of the most efficiently administered programs of the U.S. Government as recipients of benefit checks can testify. In calendar 1979, administrative costs paid out of trust funds amounted to 1.5 percent of benefit payments for OASDI, 2.2 percent for HI, or about $2 billion in total.

Current Problems -- Both the nature of the pay-as-you-go system and inflation have contributed to Social Security's financing problems, which became apparent in the decade of the seventies as benefits gradually outpaced contributions. In 1970, contributions to the OASDI program amounted to $35 billion while benefits paid out were $32 billion. Since 1975 -- the first year that benefits exceeded contributions -- the deficit has risen until by 1979 contributions were $103 billion, with benefit payments at $104.3 billion. Total Social Security benefit payments grew by 227 percent in real terms between 1970 and 1979 and the costs of these benefits rose from 5½ percent to 9 percent of payroll. These increases are due in part to indexing (automatic cost-of-living increases), in part to the 39 percent increase in the number of beneficiaries in the decade, and in part to an expansion of benefits not related to inflation-proofing. In addition, the total number of beneficiaries of the Disability Insurance (DI) component of the Social Security system increased 92 percent during the decade from 2.7 million to 4.8 million, of whom 2.9 million are disabled workers, 1.4 million are dependent children, and 475,000 are spouses of disabled workers.

Currently legislated Social Security pension benefits far exceed currently legislated taxes to pay for the benefits. If unemployment, inflation and the rate of economic growth remain at unacceptable levels, this potential time bomb could explode unless it is defused by various means, including but not limited to increasing the retirement age, reducing benefits, expanding the coverage of Social Security to include Federal employees in order to increase revenues, or some combination of these. Obviously, some of these possibilities are unpopular and unrealistic but they are being studied. However, interfund borrowing among the various Social Security funds could take care of this problem temporarily and a return to higher level long-term growth could reduce greatly, or even eliminate, the need for these considerations entirely.

Stagflation, with its ratchet effect on Social Security, has exacerbated the problem. As unemployment worsens, contributions to the system decline while, at the same time, benefits paid out of the system increase. This has resulted in a substantial decline in the OASI trust fund and raised the spectre of contingent liabilities which may outstrip the system's current ability to pay.

Costs are not the only problem. There is a possibility that the structure of Social Security benefits and taxes discourages workers who are eligible for benefits from continuing to work. Almost 9 out of 10 persons who received Social Security cash retirement benefits in 1978 opted to retire at age 62 to 64, even though their monthly benefits were lower than if they had waited until age 65.

Perhaps more serious in the longer run, Social Security may discourage saving and capital formation. One reason is the pay-as-you-go nature of the system -- current contributions pay for current benefits. The result is that the trust funds do not build up large accumulations of money which might be available for lending to capital investors. Another reason is that the promise of Social

Security retirement benefits may be a disincentive to personal saving which could be used for capital investment.

A potential problem inherent in the pay-as-you-go system is that today's workers -- who start their careers with higher contributions than their parents -- may not receive proportionately higher benefits from the system, particularly if, as seems likely, they have small families and are relatively high earners. On the other hand, in some cases, current benefits mean less burden on workers to help support parents or grandparents.

Still another type of problem, receiving a good deal of attention lately, relates to inequities in Social Security. These stem largely from the system's failure to keep pace with the economic and social changes of recent years, especially the status of women, which has changed radically in the post World War II years. In 1947, there were under 17 million women in the labor force and by 1979 this figure exceeded 43 million. Over half of America's adult women now work for pay outside the home. The Social Security law based its benefits to women on the assumption that they were dependent on their husbands' earnings. One result is that in a marriage in which both partners work, Social Security does not provide commensurately for paid work by both spouses. For example, the law entitles a wife (or husband) to a "spouse benefit" equal to 50 percent of the husband's (or wife's) benefit, but a working wife who would be entitled to both a "spouse" and a worker benefit receives only the greater of the two. The result is that one-earner couples generally receive greater benefits than two-earner couples with the same total earned income.

Changes in marital patterns and the striking increase in divorce also affect the equity of Social Security benefits. For example, at present, a woman divorced after less than 10 years of marriage is not eligible for any Social Security benefits as a dependent of her ex-spouse but only for benefits she may have earned. Widow's benefits are often inadequate as they are related to the standard of living at the time of the husband's death, rather than at the time benefit payments begin. Recent studies have suggested that for the long run, the Social Security Administration should consider an *earnings sharing* approach which would give each spouse half of a couple's combined wage credits earned during marriage. The Social Security Administration is now considering changes in benefits for divorced spouses, aged widows and widowers, and two-earner couples.

Supplemental Security Income -- Another component of the Social Security System -- Supplemental Security Income (SSI) -- is a means-tested assistance program which provides support to needy aged, blind and disabled persons without regard to earnings.

Although administered by the Social Security Administration, it is not part of the OASDI insurance system. Its original forerunner -- Old Age Assistance -- was a cost-sharing program in which the Federal Government paid 50 percent of the benefit cost if a state provided assistance to the aged in plans approved by the Social Security Board. Since many aspects of the program -- such as the assets test, level of benefits, and degree of family financial responsibility -- were left largely to the individual states, there was great diversity among state programs, far more than justified by cost-of-living differentials in different localities. Until 1972 there were few changes in the Federal provisions of Old Age Assistance except in the cost-sharing formula. All states periodically raised their support levels with the wealthier, more industrialized states providing higher levels of support.

The formulators of the Social Security Act in 1935 anticipated that OAA would, in time, become unnecessary, or at most a help-of-last-resort for the relative few who would not have adequate income from their Old Age Insurance (OAI) benefit, but this expectation was disappointed. Although the percentage of the aged receiving this welfare assistance declined from over 20 percent to less than 10 percent, the number of recipients has remained roughly two million.

Congress enacted the Supplemental Security Income (SSI) program in 1972, federalizing the adult categories of welfare -- Old Age Assistance (OAA), Aid to the Blind (AB), and Aid to the Partially and Totally Disabled (APTD). The Federal system raised the benefit in the lowest paying states and simplified the diversity of burdensome, administratively costly provisions in the asset and income tests devised by the individual states. States have the option of supplementing the Federal program and one-half of them do so.

Unlike OASI, Supplemental Security Income is fully financed from general revenues. The maximum Federal payment varies for single versus couple recipients, and is pegged at approximately 70 percent of the poverty thresholds -- beginning in July 1980, $2,856 for a single person, $4,284 for a couple. The maximum grant rises automatically with the Consumer Price Index, as do the poverty thresholds. The first $20 of *earned* or *unearned* income is excluded or disregarded from the benefit computation; in addition, the next $65 of *earned* income is also excluded. As to the application of these income disregards, SSI has a 50 percent benefit reduction rate on earned income over $65 per month, and a 100 percent reduction rate on unearned income (including Social Security and other retirement benefits) over $20 per month. This $20 disregard was provided in the original 1972 law and has not been increased since, although, of course, inflation has eroded its value. Individuals with assets of

$1,500 or more and couples with $2,250 or more are ineligible for SSI benefits. This limit on assets excludes a house, automobile, household and personal effects of limited value.

In 1979, SSI provided support for approximately 2,258,000 aged persons -- with an average monthly supplement of $110.80, of which $93.61 was Federal -- at a total cost to the Federal Government of $2.5 billion. Some 38 percent of recipients also receive State supplements and over 75 percent of recipients receive Social Security benefits. Of those aged families subsisting on SSI and Social Security alone, 49.4 percent were below the poverty line in 1977; for single persons in these circumstances, 59.5 percent were officially living in poverty in 1977.

Approximately half of those eligible to receive SSI old-age benefits fail to apply for them. While the program is about as nondemeaning as a welfare program can be, it almost certainly continues to carry a stigma, which is one reason for only 50 percent participation. Lack of knowledge and confusion about the program and failure of adequate outreach may be additional factors.

Federal Retirement Systems

The Federal Government, the Nation's largest employer, operates 38 major retirement programs covering over 5 million employees. These plans pay over $15 billion per year to about 2.6 million retirees and survivors. During the decade of the seventies, the amount of benefit payments tripled and the number of beneficiaries doubled. In general, Federal plans provide for beneficiaries far more generously than private plans. For example, they replace 40 to 70 percent of preretirement earnings compared to 20 to 25 percent for private plans. In addition, almost all Federal plans are indexed for inflation in contrast to private plans which usually do not provide cost-of-living adjustments.

The Civil Service Retirement System (CSR), by far the largest of the Federal civilian programs, covers over 90 percent of civilian employees while some of the smaller and more specific systems cover personnel of the Foreign Service, Federal Reserve Board, the Tennessee Valley Authority, and Central Intelligence Agency. While participants in a majority of the smaller plans have Social Security coverage, personnel in the Civil Service Retirement System do not contribute to Social Security, nor do they receive benefits from Social Security, unless they were in other covered jobs before, during or after their Federal employment. An HEW study group recently examined the controversial issue of Social Security coverage for all government employees.

Civil Service Retirement System (CSR) -- The U.S. Civil Service Retirement System covers 2.7 million current employees and pays benefits to 1.6 million retirees and survivors, In 1979, these benefits amounted to $12.6 billion.

Participants in the system contributed about $3.4 billion to the CSR Fund in FY 1979. An additional $17 billion was transmitted to the fund from the Federal Government in a variety of ways. For example, $3.4 billion -- an amount equal to employee contributions -- was provided from the operating budgets of Federal agencies. An additional $9.5 billion from general funds was also appropriated for past benefit liberalizations, for annuities partly based on military service, and for benefit rights of newly covered groups of employees. Interest on accumulated assets is paid to the fund on an annual basis as is interest on the outstanding balance of accumulating obligations. This unfunded amount or *unfunded liability* is the difference between the future value of currently accruing benefits and projected future assets. Estimates of this unfunded liability could reach $160 billion, according to the Congressional Budget Office, or $190 billion, according to the Office of Personnel Management (OPM) by 1985.

Although Civil Service retirees do not receive Social Security benefits as a result of government employment, many of them do qualify for Social Security as a result of pre-government or, more usually, post retirement jobs. In some cases, these jobs provide them only with minimum Social Security coverage of 40 quarters or 10 years. Since the Social Security system is designed to subsidize a person with low lifetime earnings, the rate of return or the ratio of Social Security benefits to contributions favors a person who has minimum coverage. In other words, the shorter the period of Social Security covered employment, the more generous the benefits become in relation to contributions paid into the system. For example, a worker with only 10 years of high covered earnings will have his benefits calculated as though the earnings had been accumulated over 35 years. The result is that a worker with the minimum 10 years of coverage contributes only one-fourth as much as one who has been covered for 35 years, but receives nearly one-half of the total benefits. This gap between Social Security benefits and contributions provides an unintended subsidy to government employees -- a subsidy which amounted to about $1.9 billion in 1979 and which came out of the Social Security fund.

Military Retirement -- The military services retirement system differs considerably from most civilian employee systems. It is one of the most generous programs in the country, partly because pensions are an integral part of the military's unique total compensation package. Pension benefits are awarded after 20 years of service regardless of age. The 20-year retiree receives 50 percent of final basic pay while the 30-year retiree receives 75 percent. (Basic pay constitutes 75-80 percent of regular military compensation.) Members of the armed services, unlike Federal Civil Service employees, have been covered under Social Security since 1956 and have paid taxes on their earnings. In addition, since 1978, for every $300 of basic pay, the military employee receives a Social Security wage credit of an additional $100 (up to a maximum of $1,200 per year) to reflect allowances, such as housing, over and above basic pay. It is estimated that military retirees receive almost 100 percent of after tax preretirement earnings from a combination of military pensions plus Social Security. In 1980, the military system, which covers some 2.9 million persons in uniform, will pay over $11 billion to 1.37 million retirees and survivors. (Retirement benefits paid to military retirees are accounted for in the Defense Budget.)

Since most military personnel retire between the ages of 40 and 45, they receive their annuities over a much longer period of time than civilian personnel. They also enjoy a longer period of time for a second and even a third career in government and private industry. These jobs often add benefits from public and private pension plans and additional Social Security coverage to their military retirement, giving rise to criticisms about *double or triple dipping.* However, in the case of the military, it is generally believed that such potential retirement benefits from one, two or three sources can serve to induce better qualified people into the all volunteer service.

Railroad Retirement System -- The Railroad Retirement Act of 1937 established a single industry retirement plan, administered by the Federal Government, to provide financial stability for various railroad plans that were facing bankruptcy. The Railroad Retirement Act of 1974 made comprehensive changes in the system. At that time it was estimated that 40 percent of railroad beneficiaries were also receiving Social Security (OASDI) benefits. The 1974 amendments restructured the benefit formula so that employees with 10 years or more service received a two-tier benefit: the first tier, computed under the Social Security benefit formula, is based on the employee's combined earnings under the Railroad Retirement System and under Social Security, with safeguards against dual payment for the same employment; the second tier is based only on railroad service and earnings. At the end of 1979, the system covered over 550,000 workers but had over a million beneficiaries -- 460,000 annuitants receiving benefits of $2.5 billion and 568,000 dependents and survivors receiving an additional $1.7 billion.

The system has continuing financial problems. An official valuation in July 1979 indicated that the fund could become exhausted and unable to pay benefits at some point in this decade. The Railroad Retirement Board, railway labor and management have been holding discussions with a view to suggesting appropriate legislation to Congress to resolve these financial problems.

State and Local Government Plans -- There are now 6,630 State and local pension plans covering some 13 million employees. The enrollment and assets of these plans have increased at an even faster rate than that of all pension plans, to a large extent because of the overall growth of State and local government in the last 20 years. The number of active employees in the plans administered by State and local governments grew from 2.9 million in 1950 to 13.5 million in 1978 (out of a total of 103 million civilian labor force workers). One in 10 workers is now employed by State or local government.

There is wide variation between these plans with respect to funding, vesting rights, income replacement ratios, benefit formulas and relation to Social Security. Recent proposals are now being studied to coordinate and regulate State and local plans.

The assets in these plans as a percentage of total assets of all pension plans grew from 13.6 percent in 1950 to 26 percent in 1975 and from 20 percent of all government administered plans in 1950 to 55.5 percent in 1975. In 1978 State and local plans paid $9.6 billion to over 2.2 million retired workers and their survivors and dependents. Their financial assets totaled $142.6 billion in that year.

A General Accounting Office (GAO) analysis of State and local government pension plans showed evidence of an increasing overall financial burden on these plans caused largely by the increasing proportion of retirees. It is estimated that only 20 percent of State and local employees are enrolled in plans that are fully funded by actuarial standards. Concern has arisen about whether pension benefits provided or promised by State and local governments are too generous (at least in relation to emerging problems). GAO estimates that assets will grow throughout this century but at a much lower rate after the year 2000. Benefits are expected to exceed contributions after 2012, when the baby boom children retire. The question gains urgency from the fact that State and local pension obligations are a costly lien on some governmental units, especially on older cities squeezed between declining tax bases and increased social and developmental needs.

Changing Sources of U.S. Retirement Income -- The total retirement, disability and survivor benefis of Social Security and of public and private pension plans grew from 2 percent of GNP in

1950 to over 8 percent in 1975. In this period, the relative roles of public and private systems changed. In 1950, Social Security paid 27 percent of all retirement, survivor and disability benefits. By 1976, Social Security's share of benefit payments had doubled while the share of benefits paid by public and private plans decreased. In 1976, all Federal programs including Social Security accounted for about 76 percent of benefits paid, private plans about 17 percent, and State and local plans 6.5 percent.

Private Pension Plans

The hallmark of private pension plans is the number and diversity of their provisions with respect to benefit formulas and retirement age. There are about a half million pension, profit-sharing, and stock bonus plans. The main growth in private pension plans began in World War II when the government imposed a freeze on wage increases and pensions became a major form of compensation for workers.

Until 1974, when Congress passed the Employee Retirement Income Security Act (ERISA), there was no systematic Federal regulation of most aspects of private pension contracts. ERISA protects employee benefits by setting minimum standards for participation and for vesting which means that a pension participant, after meeting certain requirements, retains a nonforfeitable right to a retirement benefit, even though he or she may leave the job before retirement age. ERISA also provides for reporting and disclosure and sets minimum funding standards for pension plans. ERISA established the Pension Benefit Guaranty Corporation (PBGC), financed by a per capita premium from covered plans, to protect workers and retirees against loss of benefits when a plan is terminated with insufficient assets to pay benefits earned. PBGC is governed by a Board of Directors consisting of the Secretaries of Labor, Commerce, and the Treasury.

A recent government survey of pension plan coverage estimates that in 1979, over 30 million persons -- about half of all private wage and salary workers -- were covered in private pension, profit-sharing or other retirement plans. About half of those covered had acquired vested rights to their benefits. The vast majority of those not covered worked for companies where pensions were not available to any employee. The survey also found that, because of certain job characteristics, women were much less likely than men to be covered by a retirement plan and to have acquired vested rights to their benefits.

In 1979, private plans paid benefits of about $15 billion to a little over 7 million beneficiaries. About 5.4 million beneficiaries were paid $12.3 billion by pension trusts; an additional 1.7 million beneficiaries were paid about $2.5 billion by life insurance companies.

The formation and maintenance of pension programs, whether by employers or through collective bargaining, is strictly voluntary. There are two types of private pension plans: defined benefit and defined contribution. About one-fifth of the plans, covering about 60 percent of all plan participants, are defined benefit plans which usually gear benefits to years of service and either to earnings or a stated dollar amount. These plans are insured by the Pension Benefit Guaranty Corporation. Defined contribution plans are profit-sharing, stock bonus, or money purchase arrangements where the employer contributes an agreed percentage of wages (or profits) to the worker's individual account. The eventual benefit depends upon the total contributions and investment earnings in the intervening years. These plans, by their nature, are fully funded and therefore are "self-insured." Most pension fund assets are managed by bank trust departments, investment management firms, or life insurance companies.

Most plans are single employer plans, but industries such as coal mining, construction, trucking and retail food have multiple employer retirement plans in which several unrelated companies participate under terms of their union contracts.

While participants in single employee plans have been protected by PBGC's termination insurance program under ERISA since 1974, Congress has postponed the effective date of mandatory coverage of multiple employer plans four times, although PBGC has come to the aid of a few such plans on a discretionary basis. Some multi-employer plans, in troubled industries with a high proportion of retirees to workers, would probably take advantage of mandatory PBGC coverage if it were to become law. This could mean that the government would be responsible for benefit payments for every insolvent multi-employer plan, but the problem is that PBGC funds are inadequate to meet these very large potential obligations.

The inauguration of comprehensive regulation of private pensions in 1974 brought several problems. Meeting the standards laid out in the Employee Retirement Income Security Act (ERISA) generally meant certain additional costs to firms providing private pensions. Because some of these overhead costs were not related to the size of the plan, small business carried a relatively larger burden. In the four years following enactment, 24,000 plans with benefits guaranteed by the Pension Benefit Guarantee Corporation (PBGC) terminated, some because of ERISA's increased paperwork and cost burdens and some because of adverse economic conditions. A large number of plans simply chose to terminate rather than meet the minimum standards imposed by ERISA particularly in regard to vesting and funding. However, an estimated 11,000 new plans were established in the same period.

Government has recognized the importance of private pensions by regulation under the tax code. For FY 1980, the tax deductions allowed for qualified plans amounted to a revenue loss of about $13 billion. Without such favorable tax treatment, pension plans would undoubtedly not exist in their present magnitude.

About 60 percent of private pension plans covering about 30 percent of all plan participants are *integrated* that is, their benefit formulas or contribution levels are related to Social Security. Different integration formulas provide significantly different earnings replacement. In some cases, in fact, participants in fully integrated plans may receive little or no pension benefits even though they worked long enough to meet the plan's vesting requirements. Low and middle-income workers, women workers, and short-term workers are particularly vulnerable. While most plans are not fully integrated, it is possible for a worker with as much as 30 years' service and final year's earnings of up to $10,000 to receive little or no pension. The reason is that under the Internal Revenue Code, integrated plans are permitted to weight or *tilt* their benefit formulas in favor of higher paid employees since Social Security benefits are weighted in favor of the lower paid.

One criticism of the private pension system is that a significant number of individuals do not receive benefits either because they are not covered by a plan or because they fail to meet the plan's vesting provisions. (Most private plans require 10 years of participation before accrued benefits vest). This criticism is sharpened by the fact that workers in integrated plans may receive very small pensions or none at all even though they are vested.

Another major problem for workers in private pension systems is inflation, which has seriously eroded the real purchasing power of benefits and threatens continuing decline. The reason is that few plans are automatically adjusted to cost of living or to the consumer price index (CPI), although some have made ad hoc increases. The President's Commission on Pension Policy estimates that even if private plans are indexed for one-third of the inflation rate, their share of the Nation's total retirement benefits will shrink to 7 percent in 2000 (from 18 percent in 1975) if inflation stays at 8 percent. Thus, inflation diminishes the relative importance of the role that private pensions play in the overall retirement income scheme.

III

PENSIONS AND THE ECONOMY

Pension issues should be considered within the context of overall economic activity. The current stagflation economy -- inflation and unemployment coupled with slow growth -- emphasizes the importance of pension policy decisions in the broader context of economic growth. Until the early 1970's, a distinguishing feature of the U.S. economy was the rapid rise in real per capita income. In recent years, however, low per capita income growth due to low productivity has underscored the difficulties of providing adequate pension benefits to retirees. Inflation squeezes everyone but especially those living on fixed incomes, and thus the inflationary spiral challenges the stability and adequacy of retirement income systems. Many retirees receive an increasing portion of their incomes from Social Security, which is adjusted for inflation. However, only three percent of private plans have an automatic cost of living increase, while the balance are either adjusted on an ad hoc basis or provide no adjustment for inflation whatever.

In addition to low growth and inflation, other post-World War II changes -- economic, social and demographic -- also have had tremendous bearing on U.S. pensions and on U.S. productivity. These changes include the growth of government, especially income maintenance and Social Security programs; the greatly increased participation of women in the work force, which substantially altered the ratio of employed adults to the total adult population; the shift to small families with a decline in the U.S. birth rate; and an increase in life expectancy for the elderly.

Retirement and Productivity

Since World War II, not only has life expectancy increased but the average length of the retirement period has risen by nearly 35 percent. In the future, there will be fewer workers to support many more retired persons. In 1960, the ratio of the working age population to the population age 65 and over was 6 to 1; today it is about 5.4 to 1; by the year 2000 it is expected to be 5 to 1; by the year 2020, 4 to 1; and by the year 2030, 3 to 1. Other projections indicate that:

- The elderly (age 65 and over) population could increase from almost 25 million persons (or 11.22 percent of the population in 1980) to nearly 32 million (or 12.57 percent of the population) by the year 2000.
- Social Security total beneficiaries are projected to jump from 35 million in 1979 to 47 million in the year 2000.
- The tax rate for the Social Security system as a percent of total taxable payroll could increase according to present timetables from 6.13 percent in 1980 to 7.65 percent by the year 2000 and -- based upon current Census Bureau population projections -- to over 14 percent by 2030. The most dramatic increase is projected to occur between 2030 and 2050 when Social Security taxes could jump to about 20 percent. Every .1 percent increase in tax is about $1 billion in Social Security tax revenue in 1980 dollars.

These figures indicate how the future of pensions will be affected by the decrease in the population growth rate and by an increase in the old-age population as the post-World War II baby boom creates a seniors boom early in the 21st century. The figures, however, must be viewed as tentative. No one can forecast economic conditions or political responses with certainty.

The base of pension plan funding -- the working population -- is shrinking steadily because of demographic factors, and because of the trend toward early retirement. In 1950, about 80 percent of males in the 60-64 age bracket were working, but by 1979, this number had dropped to about 62 percent. This decline has been offset in part by the rise in female labor force participation. In the 60-64 age bracket, participation for women is up from 20 percent in 1950 to 34 percent in 1979.

Early retirement is a complex issue. On one hand, it provides a solution to economic problems when cutbacks are required in private industry or in government, when older workers cannot find jobs, when jobs are needed for younger workers, and when older workers are unproductive due to poor health. On the other hand, early retirement can create problems because it increases the number of retirees and raises benefit costs, it removes productive workers and taxpayers from the labor force and from the tax rolls, and it raises the threat that retirement income may not be adequate in the later stages of retirement -- especially since retirees are living longer.

The significant increases in life expectancy also affect retirement decisions and pension policies. When the Social Security system was established in 1935, for example, 65 year old males could expect to live about 11 years to age 76; by 1977, this group could expect to live 14 years to age 79. The life expectancy of 65 years old females in the same period increased from over 12 to 18 years. When these figures are multiplied by the number of people in the age 65 and over cohort, which rose from 3 million in 1935 to 8 million in 1977, the growing burden on the Social Security system and, indeed, on all retirement income systems is clear.

In spite of increased life expectancy, people are not working longer, partly due to the existence of age-specific pension programs (public and private) which tend to discourage labor force participation of those eligible to retire. Evidence suggests that Social Security has had some work disincentive effects. Social Security's earnings test -- the 50 percent benefit reduction rate on annual earnings above $5,000 for persons age 65 to 72 -- discourages aged persons with higher earnings potential from working. Currently, the majority of Social Security retirees claim their benefits as soon as they are eligible after age 62. In fact, early retirement is provided in almost all private and government employee plans. It is even arguable that a spillover disincentive of Social Security has occurred since many private plans gear their early retirement provisions to Social Security.

While the effect of this reduced supply of labor on total output is problematical, national needs for special skills and adequate income levels suggest that encouraging continued labor force participation is worthwhile. There have been recent moves in this direction. Congress recently raised the mandatory retirement age for the private sector from 65 to 70 and eliminated mandatory retirement from the Federal Government altogether. The fact remains, however, that U.S. Government and industry are probably unlikely to encourage older persons to remain in jobs or to take new jobs as long as there is widespread unemployment or as long as there are younger workers available. Probably not until after the year 2000 will the economy really need older persons in the labor force. At such a time, government and industry will probably provide the incentives. In the meantime, industry executives point out that they are losing experienced, disciplined and productive workers through retirement.

Maximizing and diversifying opportunities for productive, gainful employment may prove an attractive option for older workers who are eligible to retire. European countries provide examples of ways in which to encourage continued labor force participation, such as removing compulsory retirement provisions, easing prohibitions on employment as a condition of pension receipt, increasing pension amounts for those postponing retirement, and instituting a system of partial pensions along with part-time employment. Some countries, notably Germany, pursue a policy of *social investment* which provides retraining to improve occupational mobility and to keep abreast of technical developments and aid in job placement. A few large U.S. corporations are also encouraging older workers to remain on the job through innovative programs such as phased retirement with part-time work and *retirement rehearsals* in which employees take off some months without pay with the option of returning to work.

One important reason for U.S. policy to encourage continued labor force participation is the impact of early retirement on the Social Security system. Earlier retirement obviously means smaller contributions and a longer benefit period. The Organization for Economic Cooperation and Development (OECD) estimated, in 1976, that the potential savings for an average country could be in the order of 0.3 percent of Gross Domestic Product (GDP) for each one year by which pensionable age was postponed. For the U.S. Social Security system in 1979, this could have meant an additional $7.29 billion (as GDP in 1979 amounted to $2.43 trillion). In the future, the burden to the economy of financing Social Security will be even greater than it is today because of the increase in the aged population relative to the working age population. This burden can be reduced by promoting later retirement, by changes in the Social Security law, in pension regulations, and in employment practices and incentives.

Pension issues need to be viewed in the context of major demographic shifts, especially the increase in the number of years Americans are living. Retirement policies in both private industry and government should be updated to reflect these demographic changes in order to decrease pension costs and to increase economic growth -- the primary assurance that the real value of benefits will be maintained. Suggestions for change include gradually increasing the normal retirement age for Social Security, raising the amount of money a retiree may earn and still receive a partial Social Security benefit, and exploring the possibilities of combining part-time work and partial pensions. Meanwhile, stagflation continues to take its toll on retirement income and on the adequacy of pension benefits.

The Effects of Stagflation on Pensions

Stagflation greatly amplifies problems of pension security and pension adequacy. It affects the real value of benefits and, at the same time, jeopardizes the stability of the Social Security financing system and of pension funds. In the longer run, stagflation inhibits saving, capital formation, and productivity.

Data on the absolute or relative adequacy of private and public employee pensions is sparse. In 1975, the average private pension income was $2279 per recipient, average state and local pension income was $4101, and average Federal retirement income was $6096. In terms of replacement rates, private pensions of career earners are calculated to be 20 to 30 percent, virtually always an addition to Social Security. Public pensions are calculated at 50 percent, sometimes an addition to Social Security. However, after a decade of serious inflation, and facing a decade in which inflation is not expected to taper off much, the future adequacy of private and public pensions is apt to be more divergent. The real value of private pensions could be slowly eroded if inflation is moderate or rapidly eroded if double digit inflation continues. Since more public plans are adjusted for inflation on an ad hoc or automatic basis, their real value will not be as adversely affected; in fact, Federal pensions will be unaffected. The cost of this is the other side of the coin. Obviously, Federal pensions and the more generous State and local pensions are by far the best plans for retirees. They approach fully inflation-proof pensions that result in little decline in the standard of living after retirement.

In spite of the tremendous increase in income support for the aged in the last decade, gains in the economic status of the total aged group have been quite modest. The incidence of poverty among aged persons was reduced from 35.2 percent in 1959 to 24.5 percent in 1970, and to 14.6 percent in 1974. Yet, virtually no gain has been made since then, with the 1978 percentage of aged in poverty at 14 percent. The absolute number of poor aged persons remained essentially constant from 1974 through 1978, the most recent year for which data are available. The annual totals of those two years are 3,085,000 and 3,233,000 respectively. The reason for this constancy in the number of aged poor is that the only important sources of income for this group are Social Security and Supplemental Security Income (SSI). Benefits from these programs are inflation proof, as are the poverty thresholds themselves. However, unless benefits are increased by law, the only way for real benefits to rise is through higher earning histories of new retirees and resultant higher Social Security benefits.

Older women, Hispanics, and blacks are more likely to be in poverty than are aged white males (and those aged in families headed by white males). For aged women, 23.9 percent are poor; for older Hispanics, 23.3 percent; for older blacks, 33.9 percent as compared to 7.4 percent for aged white males.

The poverty threshold is admittedly low -- $3,116 for an aged single person in 1978, $3,917 for a couple. How many persons are just above the thresholds? The answer is clear from the percentages with incomes below 125 percent of the poverty threshold: 23.4 percent of the total aged; 8.2 percent of white males; 37.9 percent of women; 37.3 percent of Hispanics; and 49.8 percent of blacks. Although Social Security and SSI play a vital role in alleviating what would otherwise be total deprivation for the majority of aged, they certainly cannot be characterized as over-generous. For example, the median income of men over age 64 in 1978 was $5,966, less than half of the median income of all men; for women over age 64 median income was $3,322.

Social Security provides sufficient income to raise the vast majority of its recipients out of poverty. However, for those aged families for whom it was the sole source of income in 1977, 30.8 percent were poor; for comparable single persons, 56.8 percent were poor; for comparable black aged families, the poverty rate was over 50 percent; for black aged singles, 69.2 percent.

In terms of replacing previous earnings, Social Security provides approximately a 40 percent rate for the median earner (60 percent for such a couple), with lower rates for higher earners and higher rates for lower earners. Particularly because absolute adequacy becomes crucial for low earners, few if any argue that these replacement rates are too generous.

The conclusion to be drawn from the adequacy data is almost certainly that income support for those in the lower half of the income distribution among the aged is *inadequate* in absolute terms. Since virtually only Social Security and Supplemental Security Income support this group, it seems clear that the benefits of these programs should be extended and increased for this poorer segment of the population. The problem is how to pay for improving these benefits in a period of stagflation.

Social Security Financing -- The Social Security system, financed primarily through taxes levied on covered wages and on self-employed income, is now at a critical point. Employers and employees pay Social Security taxes at the same rate and on the same base. Under the current-cost financing or pay-as-you-go system, current revenues are almost immediately paid out to current beneficiaries so that trust fund revenues generally approximate expenditures.

If economic conditions of high inflation and high unemployment prevail then, according to the 1980 Social Security Annual Trustees Report, reserves of the Old Age and Survivors' (OASI) trust fund could fall to very low levels -- that is, reserve levels would not be sufficient to maintain the cash flow of the program, even as early as late 1981. The Disability Insurance (DI) trust fund, and health insurance (Medicare) trust fund, however, are in reasonably good financial condition. If projected benefits are to be paid, Social Security taxes, already scheduled to rise in 1981, may have to be increased even more, or new sources of income -- from general revenues, for example -- may have to be found.

On the threshold of the 1980's, the Social Security system must face the fact that U.S. real average earnings are falling. The problem is compounded by the fact that Social Security beneficiaries have been *insured* against inflation with a financing formula that cannot raise sufficient additional revenue when unemployment is high and productivity growth low. The formulas by which the benefits and revenues are changed are not directly related to one another. Thus, no guarantee exists that the increase in revenues will meet the increase in promised benefits. In the past, the percentage increases in revenue exceeded the cost of the benefit increase because productivity gains ensured that wages usually rose more than prices. In the current stagflation environment, this is no longer the case.

Two possible solutions are to (1) limit the benefit increase to only a fraction of the increase in the cost of living, or (2) increase the amounts employers and employees must pay by raising the financing rates or tax base. Limiting the benefit increase puts the burden of inflation on those least able to bear it. Increasing employee-employer contributions worsens stagflation because it discourages economic expansion precisely when and where it is most needed by increasing the cost of labor to the firm and decreasing net earnings of the workers.

Various other solutions to the problem have been put forward, such as financing some part of Social Security from non-payroll tax revenues, taxing half of a recipient's Social Security benefits, and using general revenues during periods of high unemployment to compensate for contributions lost. Interfund borrowing -- from Disability and Health Trust funds to OASI -- could provide a temporary solution.

A more fundamental approach recognizes that stagflation is basically responsible for many problems of Social Security and of pensions generally. Therefore, top priority should be the development of an investment-based economic growth policy. Second, the intention of society and the government to honor pension promises should be firm both in appearance and reality. Short-run economic problems should not be allowed to threaten confidence in a system so important in the lifetime planning of almost all Americans. At the same time, persistent short-term problems -- such as stagflation -- have long-range effects as they impact on capital formation, investment and productivity.

The United States must decide whether to emphasize a policy of consumption-oriented programs in the short term or savings-oriented production programs in the long term, especially when the former counteract the latter. For example, there is an obvious immediate need to bolster funding arrangements for Social Security (OASI). However, a short-term financing measure may have a negative effect on long-run solutions to inflation and productivity. In effect, Social Security now funds current consumption. Depending upon the method which Congress eventually chooses to ameliorate current financial difficulties, the system could compete for funds with other, possibly more investment-oriented government programs, while at the same time discouraging saving.

An investment-based growth strategy would encourage saving. If pay-as-you-go Social Security does reduce saving, then, some argue, capital formation is inhibited, at least in the long term. There is a need for further analysis of Social Security financing to consider various types of *advance funding* -- such as at least partial backing by trust funds -- and the consequences for U.S. investment.

The increase in pension costs associated with inflation and an aging population lends urgency to these critical questions about the future financing of Social Security. The goal is an acceptable cost-benefit balance between generations without increasing costs and without sacrificing the adequacy and equity of real benefits. All workers should reasonably expect that their future benefits will reflect their tax payments on increased earnings, and at the least that they will be guaranteed adequate and inflation-proof Social Security benefits.

Saving and Capital Formation -- The relation of pensions to saving, to capital formation and, therefore, to economic growth is a complex and many-sided question. The benefits paid out and the taxes or contributions paid into pension plans and Social Security potentially affect and are affected by millions of private economic decisions: private saving for retirement, private bequests, support of elderly parents by children, age of retirement, and employment decisions of workers and firms.

Policies that impede saving, investment, and growth in rate of output per employed worker exacerbate inflation which, in turn, erodes the value of pension benefits. If inflation is to be overcome, there is urgent need to upgrade and expand the productive capital stock of the United States. Since the amount of investment is constrained by the amount of real saving that occurs in the economy, special attention should be given to encouraging saving and to lessening or eliminating disincentives to save.

Private and some public pension plans play an important role in capital formation, since the assets of their pension funds provide an enormous pool for investment. The growth of assets of major private pension programs in the United States is a striking example. In 1960, these assets amounted to $52 billion; by 1970 they were

$138.2 billion and by 1979, over $330 billion, more than a six-fold increase in two decades and a major source of investment capital. This is one reason why serious consideration should be given to policies which would expand the private pension sector.

Social Security, on the other hand, builds up no capital stock, since it is funded on a pay-as-you-go basis, and therefore provides no assets for investment. Moreover, there is some evidence to suggest that the expectation of Social Security benefits tends to reduce the incentive for private saving.* Since this private saving by millions of individuals would have been available to finance investment, the result is a smaller capital stock which means lower productive capacity, lower output, and lower living standards. On the other hand, any decrease in private saving may be offset by private intergenerational and intrafamily transfers of income, but there is little reliable data to prove or disprove this possibility. Also, the fact that Social Security enables people to retire earlier might induce them to save more to cover the longer retirement period.

In any event, it is clear that a saving shortfall now exists in the United States. During 1979, for example, personal saving decreased to about 4.5 percent of disposable personal income compared to well over 7 percent just 5 years ago. While the existence of certain disincentives in the Social Security system may account for some of this decline, it is probable that unemployment, higher costs of living and higher taxation due to inflation are significant factors.

Saving is important not only in terms of capital formation but also, of course, as a source of adequate retirement income. The close link between private individual saving and pension benefits is obvious. Some saving incentives can be achieved through the income tax structure. For example, savings can be exempted from taxation, rather than simply deferred through individual retirement annuity plans and Keogh plans; another method is to exempt interest on savings from taxation. Because operational problems can arise with savings plans designed to avoid or defer taxes, contractual savings arrangements are often warranted. For example, Japan encourages savings by allowing certain income deductions for life insurance premiums, and some income exemptions from certain public sector bonds, interest on time and savings deposits, and interest from state savings institutions. West Germany has laws which specifically promote saving, such as *savings bonuses* on eligible savings deposits which help to spread the savings habit to all levels of the population. Large social insurance funds often serve broader capital formation purposes as in Sweden, where the employment-related pension system's substantial reserves constitute the largest single source of capital for investment.

---

* A recent study by economists in the Social Security Administration, however, turned up substantive analytical errors in the evidence. The new study's conclusion is that social security has not significantly reduced saving.

Projections of Pension Costs

The spectre of slow economic growth coupled with the growing older population suggests future cost increases for all types of pension support, both absolutely and as a percentage of payroll or total consumption. The pensions time horizon of 60 or more years into the future requires extraordinary financing provisions and monitoring to insure that obligations will be met.

Projections are very difficult to make with any great degree of accuracy. Costs of pensions -- Social Security, Federal, State and local government, and private -- are all affected by inflation. However, some general observations can be made.

Social Security Projections -- The future costs of Social Security benefits will rise over the next 50 years mainly due to demographic factors -- from about 10.35 percent to between 16 and 21 percent of payroll (depending upon the Census Bureau population projections used). However, policy changes that would directly increase future Social Security benefits would have the more important effect on future costs.

Under economic assumptions used for the first budget resolution in FY 1981 developed by the House and Senate Budget Committees, reserves of the Old Age and Survivors' (OASI) trust fund could fall to extremely low levels by late FY 1981. If, according to Committee figures, the cost of living increased 14.3 percent in FY 1980, 9.9 percent in FY 1981, 9.8 percent in FY 1982, and if unemployment levels (in percent) were at 6.4 in FY 1980, 7.5 in FY 1981, and 7.6 in FY 1982 -- OASI reserve levels would be insufficient to maintain the cash flow of the program. Projected reserves would fall from 34 percent of FY 1979 expenditures to 1.9 percent of FY 1983 under Budget Committee projections. (By the beginning of FY 1981, OASI trust funds are expected to be totally depleted. However, disability and health insurance trust funds are quite strong, which will enable a short term internal realignment between OASI, DI and HI trust funds).

Federal Civilian Employee Projections -- The future costs of Civil Service pensions could rise substantially, depending upon a number of factors, most notably inflation. In 1975, the Federal Government contributed about $6.7 billion to Civil Service Retirement funds while employees paid in about $2.5 billion. In

1978, because of cost of living increases and other features, Federal costs had mounted to $11 billion while employees paid in $3 billion. By 1990, in a simple extrapolation, the Federal costs could mount to $80 billion. By 2000, using the 1975-78 compound growth rate of 18 percent, the Federal cost could be an astronomical $420 billion. By the same token, employee costs increased at a 6.3 percent rate between 1975 and 1978. By 2000, employee contributions could rise to $11.5 billion.

State and Local Pension Projections -- Analysis of the costs of State and local pensions suggests that costs will grow from 8 percent of payroll in 1980 to 17 percent of payroll in 2020. (The comparable Social Security figures are 8.6 percent and 12.0 percent, with the greatest Social Security cost of 14.2 percent occurring in 2030).

Benefit payments are projected to grow steadily throughout the remainder of the 20th century, and more rapidly after the end of the century. Total payroll increases steadily, driven upward mainly by inflation. The ratio of benefits to payroll remains roughly constant until the year 2000 when benefits begin to grow more rapidly, reaching 17 percent of payroll in 2020 compared to 8 percent in 1980. The ratio of retired employees to the total of active and retired employees increases from 15 percent in 1980 to 24 percent in 2020. Flow of funds analysis shows that benefit costs will exceed contributions a decade after the turn of the century. Larger plans, generally better funded, should remain in good shape until well into the 21st century but the numerous poorly funded smaller plans can expect financial difficulty in this century.

Private Pension Projections -- The future of private pensions is dependent upon stable economic growth, government policies and the labor market environment. Obviously, during periods of rapid economic growth, the profitability of business is enhanced and this encourages the growth of private pension plans. The uncertainty of all these factors makes it difficult to forecast future costs. Private pensions are only one element in the labor market environment; employees, employers, and the markets that bring them together as well as collective bargaining are likely to adjust the wage and total compensation package. For example, there is some evidence of a tradeoff between present wages and future pensions, i.e., current wage increases are sacrificed for future retirement benefits. Government policy does not require an employer to provide a pension. Any action to unduly tighten government regulation of private pensions -- which could impose additional cost burdens on private employers -- has to be balanced against the possibility that some employers might then find it necessary or might choose to terminate their pension plans.

Another factor in future costs of private pensions is the possibility of inflation proofing. However, the ability or willingness of most firms to index their pension systems automatically or even on an ad hoc basis is questionable because of costs, and because earnings on pension fund investments, from which benefits are paid, may not keep up with inflation.

The following table demonstrates how the inflation rate erodes the purchasing power of fixed pensions. For example, with a 12 percent inflation rate 10 years after retirement, $100 of a fixed pension benefit will have a purchasing power of only $32, and 20 years after retirement it would have a purchasing power of $10. In other words, at 12 percent inflation, a fixed pension will lose two-thirds of its value in 10 years and 90 percent of its value in 20 years. According to U.S. Life Table statistics, American males have a life expectancy after retirement of over 14 years and females over 18 years. Thus, even with an inflation rate of 10 percent, a male's retirement benefit of $100 would be reduced to about $25 in his lifetime, and the benefit to a female worker would be reduced even further to about $15 by the end of her life.

PURCHASING POWER OF $100 OF FIXED PENSION BENEFITS UNDER VARIOUS RATES OF INFLATION

PURCHASING POWER OF $100
OF FIXED PENSION BENEFITS
UNDER VARIOUS RATES OF INFLATION

Number of Years After Retirement	Rate of Inflation			
	5%	10%	12%	15%
5	$78	$62	$57	$50
10	61	39	32	25
15	48	24	18	12
20	38	15	10	6

IV
POLICY IMPLICATIONS

This staff study on pensions is concerned primarily with the interaction of retirement income programs with the macroeconomy. Stagflation -- the persistent high rate of inflation and rising unemployment -- has major consequences for the payment of adequate benefits by public and private pension plans and by Social Security. The importance of pension fund assets to investment and capital formation provides another link to the overall economy. Demographic factors, which are resulting in the shift to a steadily growing older population, also have serious implications for pension and Social Security policies and programs.

In this current economic and demographic environment, it is impossible to place too much emphasis on the importance of productivity in determining the range of future choices in the United States. If the rate of economic growth declines, then the proportion of national income required to support the elderly increases. In a low productivity stagflation economy, all choices are more difficult -- between young and old, unemployment and retirement, wages and pensions.

The papers in this Social Security and pensions area suggest many different policy initiatives, but these initiatives are all supportive of a primary goal -- to assure that all workers, their survivors and dependents receive secure, adequate and equitable retirement benefits from Social Security, government pensions, private pensions or savings.

A summary of policy implications follows:

(1) ***Pensions and the Economy.*** Retirement income policies should be considered as an integral part of overall economic policy. The Federal Government should encourage investment-based growth policies, basic to combating inflation, as a foundation for secure pensions in the future. To this end, Congress should emphasize pension policies that provide a balance between sources of retirement income. These sources of income could include post-retirement earned income, Social Security, public pensions, private pensions, and individual savings. This staff study recommends greater emphasis on private pensions, earnings and individual savings to alleviate the burden and dependency on Social Security.

(2) *Social Security Funding.* Current funding problems of Social Security are exacerbated by high inflation rates, unemployment, and an increase in the number of beneficiaries. Projections show that Old Age and Survivors' Insurance reserve levels will be inadequate to maintain the cash flow of the program by late 1981 or early 1982. Possible short-term remedies include the use of nonpayroll tax revenues, or borrowing from Medicare and Disability trust funds to make up the shortfall in the Old Age Insurance (OASI) trust fund.

For the long-term, at least a partial shift from current pay-as-you-go funding to advance funding for Social Security could result in an accumulation of assets which could both better secure the system and aid capital formation.

(3) *Inequities in Social Security.* Congress may wish to consider proposals to correct inequities in the Social Security system which have resulted from the changed social and economic status of women. These inequities particularly affect two-earner families, divorced women, widows and homemakers.

(4) *Government Retirement Programs.* The management and coordination of various government retirement programs should be scrutinized so that some retirees do not receive benefits, often from a number of different government supported plans, which are over-generous in terms of their total earnings histories.

(5) *Private Pensions.* Government should encourage the maintenance and growth of private pensions as a means of fostering economic growth through more widespread retirement benefits and greater assets for capital investment. Increased private pension coverage would also relieve some of the pressures on the Social Security system.

These government policies should strengthen the private pension system by providing greater security, broader coverage and more adequate benefits indexed to the cost of living, where possible. Congress should study the possibility of shortening the 10-year vesting period now mandated in ERISA.

At the same time, government regulation of private pensions should not unreasonably increase private industry's costs to a point where companies would terminate their pension plans.

(6) *Income Adequacy for the Retired Poor.* Although there was negligible real growth in the economy during the latter part of the 1970's, there was a considerable flow of resources toward government supported retirement programs for the aged poor. Yet, evidence indicates that Supplemental Security Income expenditures have not significantly lowered poverty levels among the aged. In 1978, the percentage of aged in poverty was still 14 percent, with

another 23 percent just above the official and admittedly low poverty thresholds. The conclusion is that income support for those in the lower half of the income distribution is inadequate in absolute terms. For this reason, targeted programs for the elderly poor should be studied with a view to raising benefit levels and updating limits on income and assets to reflect changes in the cost of living.

(7) ***Retirement Policies.*** Government and private industry should revise their retirement policies and practices with the aims of increasing productivity and, at the same time, reducing the total costs of pensions. As the working age population shrinks in proportion to the population age 65 and over, future potential GNP may not be realized unless older Americans are encouraged to continue working. Therefore, Congress may wish to study the possibility of gradually increasing the age for Social Security benefits either for future generations or for those not now in the labor force. Congress may also wish to consider liberalizing the Social Security *earnings test* to raise the amount of money a retiree can earn without losing Social Security benefits.

In general terms, according to Social Security Administration actuaries, if the normal retirement age were changed from 65 to 66 beginning in FY 1981, then the long range savings to the OASDI trust funds would be something in the order of one-half of 1 percent of OASDI covered payroll, or about $600 million as a yearly average. (However, because it would take nearly 30 years to phase in a fully effective proposal, savings would be limited at first but would increase over the period).

According to present Office of Personnel Management (OPM) actuarial estimates, the majority of the Nation's 2.7 million Federal employees covered by Civil Service will retire at age 58. Estimates are that for each year retirement is postponed, the Civil Service retirement system saves 3.7 percent. This saving in FY 1980 could have amounted to $1.9 billion (or 3.7 percent of the total Federal payroll of $51.8 billion).

Further, government policies, including tax treatment of retirement contributions and benefits, should encourage voluntary saving for retirement.

As far as possible, retirement income systems and government policies should provide incentives to retain older workers in the labor force in productive full or part-time work.

(8) ***Capital Formation.*** Enough evidence exists to merit major study of the impact of pension funds on both capital markets and on the economic growth of various industry sectors. The magnitude of this capital pool has expanded tremendously; in 1950 its assets

represented about 13 percent of GNP and nearly 30 years later about 27 percent of GNP. It is likely that debate over the control, management and placement of these assets will intensify. This staff study recommends broad examination by business, labor, and Federal, State and local governments of the role pension funds should play in fostering economic growth.

APPENDIX

Many specialized groups have been studying retirement income issues. These include: The President's Commission on Pension Policy, with a mandate to examine public and private pensions; an independent National Commission on Social Security appointed by Congress and the President; and a number of congressional special committees and task forces. The Advisory Council on Social Security of the Department of Health, Education, and Welfare (HEW) and the Universal Social Security Coverage Study Group (of HEW) have recently completed work and issued their reports.

A list of reference materials follows:

•

The President's Commission on Pension Policy: An Interim Report, May 1980. The report provides interim recommendations based on extensive hearings, discussions, and research on tax policy, treatment of spouses, universal social security coverage, employment of older workers, and the ownership and control of pension fund assets. Also, **Preliminary Findings of a Nationwide Survey on Retirement Income Issues, May 1980.** Address: 736 Jackson Place, N.W., Washington, D.C. 20006.

•

Report of the 1979 Advisory Council on Social Security, January 1980. The fifth Advisory Council on Social Security, appointed pursuant to the Social Security Act, reviews all aspects of the social security program with particular attention to financing, benefit structure, treatment of women and minorities, coverage, disability benefits, retirement policies and relation to private pensions and Supplemental Security Income (SSI). Committee Print 96-45, House Committee on Ways and Means. Address: 1102 Longworth House Office Building, Washington, D.C. 20515.

•

An Interim Report from the National Commission on Social Security to the President and the Congress of the United States, Washington, D.C., January 1980. The Social Security Amendments of 1977 established the Commission to study, investigate and review the social security cash benefits and health insurance programs as they interact with other aspects of the social and economic life of the United States. The interim report examines reallocation and borrowing authority proposals, the 1981 tax rate and base, and other policy options for Congress' consideration. Address: National Commission on Social Security, 440 "G" Street, N.W., Washington, D.C. 20218.

•

Social Security and the Changing Roles of Men and Women, U.S. Department of Health, Education, and Welfare, February 1979. This report, mandated under the Social Security Amendments Act of 1977, studies proposals to eliminate dependency as a factor in entitlement to spouse's benefits and to eliminate sex discrimination under the Social Security program. Address: U.S. Department of Health and Human Services, 200 Independence Avenue, S.W., Washington, D.C. 20201.

•

Summary of the 1980 Reports on the Social Security Trust Funds, June 1980. Prepared by the Social Security Administration and Health Care Financing Administration. Address: 6401 Security Boulevard, Baltimore, MD 21235.

•

The Desirability and Feasibility of Social Security Coverage for Federal, State and Local Governments and Private, Non-Profit Organizations, The Universal Social Security Coverage Study Group, Department of Health, Education and Welfare, March 1980. The Study Group was established in 1978 at the direction of Congress to examine the "feasibility and desirability" of mandatory social security coverage of non-covered workers. This report reviews the extent of coverage of employees at all levels of government and in non-profit organizations; develops options for and alternatives to mandatory coverage; and analyzes their organizational, fiscal, and legal effects. Address: Department of Health and Human Services, Washington, D.C. 20201.

•

Munnell, Alicia H., **Pensions for Public Employees**, National Planning Association Report No. 171, Washington, D.C., July 1979. The report examines characteristics of Federal (civilian and military), State and local public employee pension plans including benefits, financing, portability, and coordination with social security. Address: 1606 New Hampshire Avenue, N.W., Washington, D.C. 20009.

•

Pension Facts, American Council of Life Insurance, Washington, D.C. 1978-1979. This publication provides data on major pension and retirement programs in the United States, and reviews both public and private pension plans in light of their historical growth and their future. Address: 1850 "K" Street, N.W., Washington, D.C. 20006.

Contents of Volume

The following is a list of titles and authors of papers which will appear in the final printed volume of the Social Security and Pensions section.

1. Old Age Insurance and the U.S. Economy: A Model and Some Long-Run Simulations (Frank Denton, Byron Spencer and Christine Feaver).

2. Social Security and Private Saving: Analytical Issues, Econometric Evidence, and Policy Implications (Michael J. Boskin and Marc Robinson).

3. International Perspectives on Social Security (George Rohrlich).

4. Integrated Pension Plans: An Analysis of Earnings Replacement (Ray Schmitt).

5. Projecting Costs of Private Pension Plans: An Analytical Framework (Bradley R. Shiller and Donald C. Snyder).

6. An Actuarial and Economic Analysis of State and Local Government Pension Plans (The General Accounting Office (GAO)).

Authors of Selections

MICHAEL BOSKIN, *Stanford University;* MARC ROBINSON, *Stanford University;* FRANK DENTON, *Quantec Research, Ltd.;* BYRON SPENCER, *McMaster University;* CHRISTINE FEAVER, *McMaster University;* GEORGE ROHRLICH, *Temple University School of Business Administration;* RAYMOND SCHMITT, *Congressional Research Service, Library of Congress;* BRADLEY SHILLER, *American University* and DONALD SNYDER, *University of Maryland.*

Contributors of Peer Reviews

DOROTHY AMEY, *Congressional Budget Office*
ROBERT BARRO, *University of Rochester*
IRV GARFINKEL, *Institute for Research on Poverty, Univ. of Wisconsin*
DANIEL HALPERIN, *Department of the Treasury*
SANDY HASLETT, *American Society of Pension Actuaries*
JIM HOLLAND, *Internal Revenue Service*
WILLIAM HSIO, *Harvard University*
WALTER KOLODRUBETZ, *Department of Labor*
LAWRENCE KOTLIKOFF, *UCLA*
RUSSELL MUELLER, *House Education and Labor Committee*
ELIZABETH POSTON, *A.S. Hansen Company*
GABRIEL RUDNEY, *Department of Treasury*
RAY SCHMITT, *CRS, Library of Congress*
ROY SCHOTLAND, *Georgetown Law School*
RICHARD SCHREITMUELLER, *Social Security Administration*
JAMES SCHULZ, *Brandeis University*
ROYAL SHIPP, *CRS, Library of Congress*
WILLIAM SPENCER, *American Society of Pension Actuaries*
NORMAN TURE, *Norman B. Ture, Inc.*
THOMAS WOODRUFF, *President's Commission on Pension Policy*

Authors' Biographical Data

Michael Boskin is Professor of Economics at Stanford University and Director of the Program on Social Insurance Research at the National Bureau of Economic Research. He has done extensive theoretical and empirical work on the issue of social security and private saving. Boskin is a specialist in both public finance and econometrics. **Marc Robinson** is currently working on his doctorate at Stanford University. He is a research assistant to Mr. Boskin and former Sloan Research Fellow.

As President of Quantec Research, Ltd., **Frank Denton** has been involved for the last decade in the construction of demographic-economic models and the analysis of the long-run effects of population change on the economy. He has completed a major research project for the Economic Council of Canada analyzing the long-term impact of the Canadian Pension Plan. He has published widely on the subject of demography and public spending. **Bryon Spencer** is Professor of Economics at McMaster University. Since receiving his doctorate from Rice University, he has been researching the economics of the population. **Christine Feaver** is a research assistant at McMaster University who works with economic modeling.

George Rohrlich, Professor of Economics and Social Policy at Temple University School of Business Administration, established and directs the Institute for Social Economics and Policy Research. Rohrlich has participated in pension studies for a number of organizations and governments, including the International Labor Office, the Puerto Rican Commission on an Internal Social Security System, and the National Planning Department of the Government of Colombia.

Raymond Schmitt is Specialist, the Social Legislation, Education and Public Welfare Division, Congressional Research Service, Library of Congress. His specialty is pension and retirement plans. He is a Certified Public Accountant and worked previously as a supervisory auditor for the General Accounting Office.

Bradley Shiller is Research Associate at The American University. His current research and his previous work with the Social Security Administration indicate his long experience with pension plan issues. His academic background includes a Ph.D. in Economics from Harvard University. **Donald Snyder** is an economics instructor at the University of Maryland and an economist for KOBA Associates, who has studied pension systems and retirement extensively.

Volumes of the Special Study on Economic Change

Human Resources and Demographics
Energy and Materials
Research and Innovation
Stagflation
Government Regulation
Federal Finance
State and Local Government
Social Security and Pensions
The International Economy
Productivity

The Social Security and Pensions section of the Special Study on Economic Change, Joint Economic Committee, is one of 10 sections to be released over the next several weeks. Final printing later this year will include all areas of the special study. Orders for this study may be placed by contacting:

Special Study on Economic Change
Joint Economic Committee
Room 1537
Longworth House Office Building
Washington, D.C. 20515
Telephone: (202) 225-3565

The International Economy

U.S. Role in a World Market

Book I

Joint Economic Committee

Special Study on Economic Change

A staff study

December 1980

The Joint Economic Committee's Special Study on Economic Change (SSEC) was inaugurated under the leadership of then Chairman Richard Bolling (D.-Mo.) and Vice Chairman Hubert H. Humphrey (D.-Minn.), together with Senator Jacob K. Javits (R.-N.Y.), ranking Minority Member.

The study progressed through Mr. Bolling's chairmanship and into the leadership of Senator Lloyd Bentsen (D.-Tex.), chairman; and Congressman Clarence J. Brown (R.-Oh.), ranking Minority Member. The goal of the SSEC is to chart the major changes in the economy and to analyze their implications for policymakers.

JOINT ECONOMIC COMMITTEE

LLOYD BENTSEN, Texas, *Chairman*
RICHARD BOLLING, Missouri, *Vice Chairman*

SENATE

WILLIAM PROXMIRE, Wisconsin
ABRAHAM RIBICOFF, Connecticut
EDWARD M. KENNEDY, Massachusetts
GEORGE McGOVERN, South Dakota
PAUL S. SARBANES, Maryland
JACOB K. JAVITS, New York
WILLIAM V. ROTH, Jr., Delaware
JAMES A. McCLURE, Idaho
ROGER W. JEPSEN, Iowa

HOUSE OF REPRESENTATIVES

HENRY S. REUSS, Wisconsin
WILLIAM S. MOORHEAD, Pennsylvania
LEE H. HAMILTON, Indiana
GILLIS W. LONG, Louisiana
PARREN J. MITCHELL, Maryland
CLARENCE J. BROWN, Ohio
MARGARET M. HECKLER, Massachusetts
JOHN H. ROUSSELOT, California
CHALMERS P. WYLIE, Ohio

JOHN M. ALBERTINE, *Executive Director*
LOUIS C. KRAUTHOFF II, *Assistant Director-Director, SSEC*
RICHARD F. KAUFMAN, *Assistant Director-General Counsel*
CHARLES H. BRADFORD, *Minority Counsel*

Table of Contents

Book I

CHAIRMAN'S INTRODUCTION
Senator Lloyd Bentsen i

RANKING MINORITY MEMBER'S INTRODUCTION
Rep. Clarence J. Brown iii

INTRODUCTION 1

TRADE ISSUES AND POLICY 6

THE OIL CRISIS AND ENERGY DEPENDENCE 18

RELATIONS WITH DEVELOPING COUNTRIES 23

Book II

INTERNATIONAL FINANCE 29

U.S. INVESTMENT ABROAD 40

POLICY IMPLICATIONS 49

CHAIRMAN'S INTRODUCTION

Senator Lloyd Bentsen

Chairman, Joint Economic Committee

If there is a policy priority now, it is export expansion rather than import expansion.

That one sentence found in the following study, *The International Economy: U.S. Role in a World Market,* may best summarize the findings of the Special Study on Economic Change.

In understandable terms, this study tells why it is so critical that the United States export more goods and services to the markets of the world. The explanation begins with the fact that America will be unlike other industrial countries in the next two decades because of its growing labor force.

Most other major exporting countries have stable or declining populations and labor forces, and can anticipate stable or declining employment needs. But the United States must anticipate an increase in the demand for employment of up to 1.5 percent a year in the 1980's, (15 million new jobs) and perhaps a further increase of about one percent a year in the 1990's. Thus, America *must* show substantial economic growth in the future -- faster than in other industrial nations -- merely to keep its growing labor force employed.

And while attempts are made to meet these employment demands of the future, we already have some catching up to do when it comes to employment in export businesses. It is estimated that 2.6 million job opportunities now are lost yearly in America on account of imports of manufactured products. That compares with a 1970 estimate of 1.8 million. At the 1980 rate, we would be losing almost 4 million job opportunities annually by 1990 because of imported manufactured products.

Export-related employment has become increasingly important to our overall economy. In 1980, about 4.6 million American workers hold jobs linked to exports. That's one million more than in 1973 and twice the total in the early 1960's. In manufacturing industries, roughly one job in six involves an export product. In the mid-1960's, the comparable ratio was only one in 14.

Even as the importance of exports has grown, America has seen its overall competitiveness decline in international markets as other industrial economies grew stronger. For example, throughout the decade of the 1970's, West Germany surpassed the United States as the leading exporter of manufactured goods -- a position the United States had held for many years. Germany's lead, a narrow one of $1.4 billion in 1970, rose to $33.9 billion in 1979. That's a difference of 22 percent as opposed to a half percent gap in 1970. The value of Japan's manufactured exports, 62 percent of the U.S. level in 1970, rose to 85 percent in 1979. In each case, these gains were not due to significantly lower wage rates, but rather to more rapidly rising productivity coupled with industry and government export promotion efforts.

This study points out further that this growth in world trade poses a new kind of problem. As exports make up a higher and higher share of each nation's production, more and more jobs depend on them and the temptation grows to promote exports through various government devices -- including outright subsidies from governments to industries.

Among the many lessons to be drawn from this study is that there is no longer a presumption that imports are to be encouraged, and import restraints foregone, under any and all circumstances. The study says the United States should stand firm beside a decision that America will be prepared to act swiftly against imports that are subsidized or dumped when it can be shown that domestic producers are being unfairly injured.

Another major issue addressed in this study involves the competition between U.S. domestic and foreign investment. U.S. investment inside the country consistently has been well behind the domestic investment ratio of most other advanced countries. The study suggests that sound policy now dictates examination of the potential dangers of operating a capital-shy domestic economy while U.S. foreign investment grows.

Obviously, more American capital resources should be devoted to facilities in America, especially if the United States is to reverse its productivity slump. As the study states, it is now necessary to focus on an array of incentives for much needed industrial and energy investment right here at home.

Ranking Minority Member's Introduction
CONGRESSMAN CLARENCE J. BROWN

Over the last decade, the nations of the world have become more interdependent and more vulnerable to events beyond their borders. As a result, global issues and forces have played an increasingly important role in domestic economic decision-making. International financial flows, the transition from a fixed to a flexible exchange rate system, the rising volume of goods and services traded in the international marketplace, and the demands placed on countries in bilateral and multilateral fora have all increased pressure on nations to become more fully integrated into a worldwide, consensus-based system.

What is true for other countries is true for the United States, as well. The rising inflation of the 1970's attacked this country, much as it attacked the rest of the world. As the OPEC nations raised crude oil prices from $2 per barrel to over $30, the United States suffered along with other consumers. The increased cost of oil, in turn, led many net importers of energy, including America, to suffer unprecedented balance of merchandise trade deficits. At the same time, increasing imports from developing and developed countries alike put new competitive pressures on traditional producers. In the United States, this problem was particularly acute, as our manufacturers were accustomed to supplying a seemingly limitless domestic market.

Changes in the international financial climate also increased the vulnerability of nations to the global system. Under the flexible exchange rate system in place since the early 1970's, world inflationary pressures contributed more strongly than ever before to domestic price increases and interest rate instability. The growth of the Eurocurrency markets and participation by multinational banks and non-financial corporations in world trade and investment transactions increased the complexities and unwieldy nature of the capital system. They also complicated the execution of domestic monetary policy.

The increasing openness of the United States to external forces poses vast new challenges for U.S. business and labor. At the same time, expanding interdependence also provides new opportunities. How we respond to these challenges and opportunities will dictate our position in the world economic system for decades to come.

The United States should not meet the world crises of the 1970's and 1980's with renewed isolationism. Such a policy would only lead to greater market imperfections, consumer cost, and anticompetitive practices. Rather, we should take advantage of the burgeoning markets overseas, improve our competitive capability at home and abroad, and operate cooperatively to achieve multilateral consensus. In short, we should become more outward-looking.

A dimension of the problem analyzed by the JEC study mission to East Asia last year was the indifference in Washington to U.S. export performance. While foreign competitors enjoy a rich panoply of benefits and incentives designed to help them increase overseas sales, the U.S. government acts as a naysayer to its own exporters by shackling them with a host of tax, legal and regulatory burdens. These burdens must be lifted if the United States is to improve its position in world markets.

Equally as important, we must obtain reciprocal treatment from our trading partners. Japan, the European Community, Canada and the Nordic countries have long maintained markets protected by a series of tariff and nontariff barriers (NTBs) to imports. Successive rounds of multilateral trade negotiations conducted under the General Agreement on Tariffs and Trade (GATT) have reduced most tariffs, but the more insidious NTBs remain. While the 1975-1979 Tokyo Round of negotiations began to grapple with these nontariff trade distortions, much work needs to be done. Foreign producer subsidies continue in place, many government contracts remain closed to U.S. bidders, byzantine customs procedures and distribution systems still abound along with overly burdensome standards and certification systems. Capital market restrictions imposed by many nations add to the problem.

The United States must not continue to tolerate these protectionist and distortive beggar-thy-neighbor policies by the advanced countries of the world.

We must take a firmer stand, as well, against severe import restrictions used by the newly industrializing countries, particularly those in Asia and Latin America. Many of these nations, including Brazil, Mexico and South Korea, have developed technologically superior industries capable of competing fairly in the world marketplace without the shields of protection and special treatment. We must take steps in multilateral fora, such as the GATT and

UNCTAD, to "graduate" these advanced developing countries to developed country status and responsibility.

The United States can no longer afford to absorb the world's produce without enjoying equivalent market access overseas. While we must not return to the near-autarky of the pre-World War II period, neither can we shoulder the burden of trade and financial adjustment alone. We must have the cooperation of the growing list of countries with which we do business. The stability of the world's economic system depends on it.

Special Study on Economic Change

Louis C. Krauthoff, *Director*
George D. Krumbhaar, Jr., *General Counsel*
Bill R. Maddox, *Editor*

THE INTERNATIONAL ECONOMY

U.S. Role in a World Market

Directors of study:

Oscar Gass
Consulting Economist

Richard D. Bartel
Economist, SSEC

Associate Director:

Thomas Wolfe
Consulting Economist

Editors:

Evelyn Cooper, SSEC

Edwin Dale
Economist
Economic Stabilization Subcommittee of the Banking, Finance and Urban Affairs Committee

Associate Editors:

Kent Hughes
Economist, JEC

George D. Krumbhaar
General Counsel, SSEC

THE INTERNATIONAL ECONOMY
U.S. Role In a World Market

I
INTRODUCTION

The United States emerged from World War II as the world's preeminent military, political, and economic power. The American industrial base had been broadened and modernized by war while the industrial plant of America's allies and adversaries had been virtually destroyed. America was self-sufficient in most key raw materials, including petroleum, and had only limited economic ties to the rest of the world.

The end of the war, however, marked the beginning of a new era in U.S. international economic policy. Profound global economic and political changes gradually transformed the position of the United States from relative economic independence to much greater involvement with, and even dependence on, the economies of other countries. Of the many economic changes in the 1970's, one stands out above the others: the eight-fold jump in U.S. oil import prices from 1973 to 1979. After decades of cheap abundance, the soaring cost and restricted supply of oil threatened to limit world economic expansion.

Among other significant changes were the following:

- Worldwide development of chronic inflation plagued governments and citizens.
- A slowdown in world economic growth, following a long period of rapid rise, coincided with increased competition in world markets.
- The Bretton Woods system of fixed exchange rates tied to the dollar and gold expired, to be replaced by flexible rates with intermittent governmental intervention largely based on perceived national interests.

- Sharp fluctuations in the dollar exchange rate and the emergence of other strong currencies contributed, and will continue to contribute, to a gradual reduction in the role of the dollar as the world's primary monetary reserve unit.
- The United States swung from a position of trade surpluses during most of the postwar period to one of heavy deficits in the late 1970's, because of the cost of oil imports and other fundamental factors, including poor productivity performance.
- Multinational corporations and banks extended their industrial and financial operations in markets throughout the world.
- The colonial system came to an end, replaced by a multiplicity of new independent states concerned with raising living standards and improving their economic positions.
- Technical production skills spread to the developing countries, reducing the traditional comparative advantage of the older industrialized economies.
- Control over the major reserves of world mineral resources by the less developed countries sharpened the conflict with consuming countries over the supply and prices of basic commodities and raised the possibility of competition among the major powers for access to these resources.
- The countries of Eastern Europe, the Soviet Union and the People's Republic of China gradually moved toward integration with the world economy.

While America's strategic position in the Western alliance remains largely unchanged, the emergence of a number of other economic and political powers over three decades has diffused its economic and political influence. At the same time, the creation of myriad economic ties among the world's nations has made them sufficiently dependent on a regular flow of trade and capital so that their domestic economic policies increasingly are constrained by the flux of international markets and by decisions made in other capitals. Unfortunately, this growing economic interdependence has not brought with it greater political harmony, as evidenced by the differences between the industrialized "North" and the developing "South."

By the close of the 1950's, the dozens of new postwar nations began to exert their own political and economic influence in world affairs. Several developing countries have become major manufacturers and are likely to be competitors for world markets in the 1980's. A few oil-rich developing countries have generated immense financial surpluses and have become an important force in the international financial system.

The Position of the United States

As the world has changed, so has America's place in it. Where America was once self-sufficient in key natural resources, it now imports more than 20 percent of its total energy needs and is even more dependent on imports of other raw materials. Developing countries have become important sources of low-priced manufactured goods and also markets for a large and growing share of America's manufactured exports. The American-based multinational corporation has spread American capital, technology and management techniques throughout the world. The flow of repatriated profits from foreign investments has helped limit the size of U.S. current account deficits, and thus has helped strengthen the dollar's exchange rate. Major capital centers are so closely linked and flows of capital so large that independent monetary policy has become difficult even for the United States.

In all cases, the U.S. response to the impact of external events on the domestic economy has been constrained by the fact that the United States is an "open economy" fully integrated into a world trade and monetary system characterized by flexible but managed exchange rates and considerable capital mobility -- the ease which investments may be made both here (by foreigners) and abroad (by Americans).

The total of American transactions with the rest of the world -- the balance of payments -- can be measured in various ways. Probably the most meaningful is the current account, which includes all transactions except international loans and other inflows and outflows of capital. Within the current account, the most important single item is the balance of export and import trade in goods, but a trade deficit can be offset by surpluses in other accounts, including various service transactions and the remittance of profits from foreign investment made in previous years.

In the 20 years 1960-1979, with surpluses in some years and deficits in others, the United States had a modest net current account surplus of about $30 billion, though in the most recent period of 1975-79 there has been a deficit of about $6.5 billion. While in many periods inflows and outflows of capital can swamp the current account results, over the long run the current account measures the productive competitiveness of the economy and tends to determine the dollar's exchange rate. Had the U.S. current account been stronger in the past 20 years, the dollar's exchange rate would not have depreciated against the other leading currencies, as it did during the decade of the 1970's. Although this depreciation was probably unavoidable and helped to bring the trade and other accounts back toward balance, it also was a factor in the serious inflation problem in the United States by adding to the cost of imports and domestically produced goods competitive with imports or subject to export demand.

Therefore, concern over the balance of payments and, particularly, U S. international competitiveness is understandable. The Nation must produce more if it is to earn more and consume more. A key area of concern is lagging productivity, or output per hour worked.

U.S. productivity, after a long moderate advance, not only has slowed but, most recently, even fallen. At the same time, other nations have gained in productivity per person employed. For example, in the last three decades, Japan has multiplied its productivity four times as rapidly as the United States. Japanese output per person employed rose from about 15 percent of the U.S. level in 1950 to 63 percent in 1978. West Germany, France, and Italy each more than doubled the rate of productivity advance of the United States. The Netherlands and Belgium advanced about three-fifths faster. Even the United Kingdom, the poorest performer among West Europeans, gained on the United States.

While the relative increase in the economic power of other nations and America's growing dependence on the rest of the world have challenged the traditional concept of American leadership, the United States still enjoys a preeminent position in the world economy. Its per capita income, by most reasonable measures, still averages higher than that of any other advanced country, though the gap has been closing in the last 20 or 30 years. With about one-twentieth of the world's people, the United States has perhaps one-fifth of the world's income.

Compared to other western industrial powers, the United States is rich in resources. The dollar remains the world's leading reserve currency and world trade still focuses on the immense American market. Although trade is a smaller fraction of the U.S. economy than in other countries, the U.S. economy is so large that U.S. exports and imports of all commodities and services will be in the range of $325 billion each way. The "direct" investments of Americans abroad, which involve controlling responsibilities for the production of goods and services, now carry a "book" value, which understates the true value, in excess of $200 billion. In 1980, American income from these direct investments probably will exceed $40 billion. The primary importance of American money and finance in the world economy is suggested by the fact that some two-thirds of all international economic transactions are in U.S. dollars.

Though several other large countries, particularly in Western Europe, approach the United States in current level of per capita income, at least in one respect the situation of the United States is unique. Most of these other countries have stable or declining population and labor forces, and hence can anticipate stable or declining employment needs. The United States, on the other hand, must anticipate an increase in the demand for employment of up to 1.5 percent a year in the 1980's, and perhaps a further increase of about one percent a year in the 1990's.

The natural labor force growth is augmented by the immigration factor. During the 1970's the number of legal immigrants to the United States, including refugees with immigrant status, averaged about 450,000 a year. While there is no exact information on the number of illegal immigrants in the country, estimates range from 3 million to 12 million. The United States must show substantial economic growth in the future -- faster than in other industrial nations -- merely to keep its growing native and immigrant labor force employed. Thus, while per capita income in the United States may or may not rise relative to the other advanced economies, the absolute size of the U.S. economy is likely to be even larger, compared with the others, than it is today. Despite some loss of relative economic power, the United States will remain a giant by any measure.

As the decade of the 1980's opens, the United States confronts a mix of economic problems characterized by inflation, unemployment, slowing growth and productivity. These problems of the domestic economy now are inextricably linked with issues of world-wide economic cooperation as well as competition. The issues include trade with industrialized nations and with middle-income developing countries; oil and energy; aid to the poorest countries and peoples; and capital flows including overseas investment, the international monetary system and international banking.

This staff study addresses these subjects with particular concern for their impact on the domestic economy.

II
TRADE ISSUES AND POLICY

Foreign trade policy -- typically described in shorthand as "free trade" vs. "protectionism" -- has been an issue throughout U.S. history. In the period since World War II, the debate has not ceased, but the clear direction of policy has been toward fewer and lower trade barriers. This is true despite the fact that during the 1970's, the United States experienced a growing deficit in its foreign trade, an oil crisis, several recessions and a relatively high level of unemployment.

There were, to be sure, several actions of a "protectionist" nature affecting specific products, including such devices as Orderly Marketing Agreements, Voluntary Export Restraints and countervailing duties.* But it is fair to say that neither in the Congress nor in the Executive Branch is there now a strong school in favor of a general policy of high tariffs or other devices to protect American industry and agriculture against imports. Quite the contrary is the case.

International Competitiveness

As in every other area discussed in this and other papers of the SSEC, there have been some profound changes in recent years that have a bearing on U.S. trade policy. Four stand out.

First, the United States has suffered a decline in overall competitiveness in international markets as the other industrial economies grew strongly. For example, throughout the decade of the 1970's, West Germany surpassed the United States as the leading exporter of manufactured goods, a position the United States had held for many years. Germany's lead, a narrow $1.4

---

* For an analysis of specific product actions, see "The Trade Act of 1974 as a Vehicle for Adjustment," by Stanley Nehmer, printed in Volume IX, SSEC.

billion in 1970, rose to $33.9 billion in 1979, a percentage differential of only 0.5 percent in 1970, but 22 percent in 1979. The value of Japan's manufactured exports, 62 percent of the U.S. level in 1970, rose to 85 percent in 1979. In each case, these gains were not due to significantly lower wage rates, but rather to more rapidly rising productivity coupled with industry and government export promotion efforts.*

A corollary is that it is no longer true that the United States must import more in order to provide the world with the dollars needed to buy American exports. The rest of the world has ample dollars. If there is a policy priority now, it is export expansion rather than import expansion. In fact, the primary reason for the freest possible trade is self interest. Freer trade maximizes the efficiency of the world economy, and enables U.S. consumers to acquire a greater variety and quantity of goods, both domestic and foreign, at the lowest possible cost.

Second, there is the appearance on the world scene of highly competitive exports of manufactured goods from nations that long have been regarded as "underdeveloped," and are now rapidly industrializing. The star performers in this respect are a handful of Asian countries (South Korea, Taiwan, Hong Kong, Singapore) but a number of others (Brazil, Mexico, India) are becoming important.**

In these cases, of course, relatively low wage rates make a significant difference. The result of these two types of competition is that U.S. industry has sustained losses in some industries, such as cutlery and flatware, ceramics and dinnerware, motorcycles and bicycles, footwear, hats, radios, TV, textiles and apparel. More important in the long run, competition has been growing for domestic and international markets in some of the largest and most basic U.S. industries -- steel, some types of machinery, and automobiles.

However, in some manufactured products -- especially capital-intensive and high technology goods from heavy power equipment to computers, and certainly in agricultural products -- the United

---

* See "The Changing Position of U.S. Industries in the Global Pattern of Industrial Production," by Thomas A. Pugel, printed in Volume IX, SSEC.

** See "Adjusting to Imports of Manufactures from Developing Countries," by Charles Pearson, printed in Volume IX, SSEC.

States still stands first. In 1979, the United States had a surplus of $17.9 billion in agricultural exports, a $32 billion surplus in capital goods, with a $30.2 billion deficit in consumer goods. Overall, the U.S. share of the world's exports of manufactures has declined in line with the decline in the U.S. share of world GNP, as the economies of other countries have grown faster than America's.

Despite a slower growth in U.S. exports of manufactures than has been the typical experience of other industrial countries, these exports have grown nonetheless, reinforcing the continued strong performance of agricultural exports which rose from less than $10 billion to $35 billion in the last decade. The large deficit in the overall trade balance in the later years of the decade was accounted for by the dramatic increase in the *price* of imported oil; after rising steadily, the *volume* of oil imports had begun to decline as the decade ended. While the oil imports generated some offsetting exports to the OPEC countries, the fact remains that if the cost of oil imports had been the same at the end of the decade as it was at the beginning, the U.S. trade accounts could well have been in surplus, though the balance will always fluctuate from year to year in response to cyclical influences here and abroad.*

Any nation can have a surplus or deficit in its merchandise trade, even over a prolonged period, provided its "services" transactions and other elements of the current account (or capital account) of the balance of payments offset the trade results. At the end of the 1970's, the United States' current account was roughly in balance (as addressed in the Introduction). This was despite the huge oil-induced trade deficit of more than $30 billion, because of a large surplus in services, which is a broad and somewhat misleading term. "Services" includes such items as tourism, shipping and insurance, but above all -- in the case of the United States -- it includes the huge (more than $30 billion in 1979) remittances back to the home country of the profits earned by corporate investments in foreign countries.

Third, the move of the world economy toward far more flexible currency exchange rates has greatly changed the meaning of familiar trade-influencing devices such as tariffs. The day to day price of internationally traded goods to the importer -- and hence their competitiveness against home-produced products -- now is typically a function more of fluctuations of exchange rates than of small changes in the rate of duty. Although a large portion of U.S.

---

* See "Long-Term Change in the Foreign Trade Policy of the United States," by William R. Cline, printed in Volume IX, SSEC.

exports are not particularly price sensitive, a depreciation of the dollar's exchange rate is still likely to increase exports more than various "export promotion" efforts, though only after a lag, and only if the decline is greater than the excess of U.S. inflation over that of its trading partners.*

The move to flexible exchange rates, with its accompanying depreciation of the dollar -- primarily in the first half of the 1970's -- tended to correct that part of the U.S. problem of competitiveness that arose from an over-valued dollar. But it did not completely halt the downward drift of the U.S. share in total world exports of manufactures.

Fourth, world trade -- aided by the anti-protectionist climate that generally prevailed both at home and abroad -- has grown spectacularly, rising substantially faster than world output. In the United States the share of both exports and imports in GNP has almost doubled in the past 10 years: In the case of movable goods (leaving out services), each now represents about one-fifth of U.S. total output. A similar pattern holds for other countries. France, for example, had a highly protected economy for centuries and now, thanks in part to the European Common Market, has become a more open economy, though a number of trade barriers remain, particularly in agriculture and some high technology industries.

While this growth of world trade undoubtedly has been of great benefit to the general welfare and prosperity, it also poses a new kind of problem. As exports make up a higher and higher share of each nation's production, more and more jobs depend on them. And thus the temptation grows to promote exports through various government devices, including outright subsidies; in the cases of individual firms, the need to obtain and retain markets abroad creates a strong inducement for "dumping."

In general, the United States is likely to face increased competition for both international and domestic markets. Japan and Western Europe are intent on challenging America's lead where it still exists -- in aircraft, computers and some other high-technology areas. And competition certainly will not lessen in the area of consumer goods and the more traditional manufactures such as steel, particularly where there is excess capacity in the world. Future competition, of course, includes that to be expected from the newly industrializing or "middle income" developing countries.

---

* See "Monetary and Fiscal Policy with Adjustable Exchange Rates," by William H. Branson, printed in Volume IX, SSEC.

U.S. Policy Choices

These changes do not undermine the traditional merits of freer trade -- enhanced competition at home, benefits for consumers in wider choice, improvements in the general welfare from international specialization. But they do make policy choices for the United States somewhat different from what they used to be.

One choice essentially has been made by Congress and this study would not seek to change it. It goes under the name of "fair" trade and amounts to a decision that the United States will be prepared to act firmly against imports that are subsidized or dumped, provided only that these reports can be shown to injure domestic producers. Subsidies in particular now take a wide variety of forms. Some of them -- such as those associated with regional policy -- ostensibly are designed to achieve only domestic purposes in the home country rather than to help exports as such. Thus, subjective judgments are unavoidably involved in each specific case of requested relief, but there is no longer a presumption that imports are to be encouraged, and import restraints foregone, under any and all circumstances. There should also be no opprobrium attached to use of the "escape clause" in the trade law, which provides for import restraints -- usually temporary and phased out over a period of years -- where a domestic industry has been injured, even if the imports in question are neither subsidized nor dumped. There are many safeguards against abuse of the escape clause, including a high degree of Presidential discretion in imposing restraints, and there is no evidence that this seldom-invoked provision of the law has altered the basic course of U.S. policy which remains in the direction of fewer trade barriers.

Another policy issue raised by the new world trading situation is ironic, in the light of history. One of the chief reasons for establishment of the International Monetary Fund and a set of rules for the world monetary system -- chiefly exchange rate rules -- was the fear of "competitive depreciation" of currencies, such as had been practiced in the years of the Great Depression of the 1930's. Now, in an age of inflation, that no longer is the problem. Nations are reluctant to devalue -- even if such a move helps exports -- because a downward change in the exchange rate makes domestic inflation worse. Today's problem is different, though analogous. The typical international "sinner" today is the nation that refused to let its exchange rate rise, for fear of harming its export industries. To the extent that a nation -- through intervention on the foreign exchange markets or controls on incoming flows of capital -- prevents appreciation of its exchange rate that otherwise would occur, it is in a real sense subsidizing its exports and penalizing imports, and thus hurting other nations. The revised articles of agreement of the IMF explicitly recognize this problem, and it is fair to say that nations such as Japan, which once regarded exchange rate appreciation with great fear and trepidation, are now much more willing to abide by the rules of the game and allow their currency values to float upward as market forces dictate. Nonetheless, the problem of exchange rate manipulation will be a continuing one in the years ahead, and it is as much a problem of trade policy as of international monetary policy.

Agricultural Trade

One trade policy problem has not changed, but a kind of resignation has settled in about dealing with it. Practically every nation in the world has treated agriculture as a special case in trade policy, maintaining many kinds of instruments such as variable levies and outright quotas to protect domestic farmers against cheaper imports. With the possible exception of New Zealand, the United States has been the greatest sufferer from this stubborn refusal of the world to risk agricultural free trade, simply because the United States is the most efficient producer of a wide range of agricultural products, particularly grains. However, the United States does not have completely clean hands because it, too, has rigid protection in some items, such as dairy products.

American negotiators have fought a long, and only partially successful, battle in a series of trade negotiations lasting for three decades to improve access for U.S. farm products in foreign markets, particularly the markets of Europe and Japan. But while foreign barriers remain, U.S. agricultural exports have risen impressively all the same, as noted earlier. This is because of sharply improved U.S. productivity in agriculture, which holds down U.S. costs, and because the rest of the world needs more food. Even if domestic farmers in foreign countries are guaranteed the opportunity to sell their products first, making the United States a kind of residual supplier, demand growth has been so great that U.S. exports have continued to increase.

The welfare of the world's consumers of food has not been well served by the combination of domestic support prices and import barriers that is the farm policy in most of the world. In theory and in practice, agricultural free trade would mean cheaper food nearly everywhere. But there are powerful social and political reasons for the present state of affairs, and a major change cannot be regarded as probable.

Imports from Developing Countries

Probably the most difficult trade policy issue in the years ahead -- though now it is little more than a cloud on the horizon -- will involve imports of manufactured goods from the "middle income" (and a few "low income") developing countries. As noted elsewhere in this paper, the single greatest contribution the United States can make to the economic advancement of these countries -- far greater than "foreign aid" -- is to maintain and increase U.S. imports from them.

Furthermore, the U.S. record has been good to date, despite some import restraints such as those on textiles from nearly all countries and on televisions from South Korea and Taiwan. Excluding oil, imports from the developing countries have approximately quintupled in the last decade, reaching almost $45 billion in 1979.

The problem has arisen when the volume and variety of these imports begin to have a larger impact across U.S. industry. While many elements enter into the cost of foreign goods, there is no doubt that labor costs in these countries will continue indefinitely to be far lower than those at home or in other industrial countries. It is possible, of course, that this issue will never become acute but rather will emerge as a series of specific cases, spread out over time, that are resolved pragmatically under U.S. law.

In addition, in many cases imports from the middle income developing countries will displace imports from Japan or parts of Europe rather than domestic production. If the United States pursues a policy that is basically one of an open economy, other countries must understand that there will be occasional exceptions -- an escape clause injury case here, countervailing duties imposed against subsidized imports there. In any case, there seems no present reason for the United States to adopt a "new" trade policy to cope with this problem. If current practice is followed, it is clear the export volume to the United States from the poorer countries will continue to grow.

Adjustment Policies

This prospective growth, even if it does not require a change in trade policy as such, is likely to focus greater attention on the need for "adjustment" policies in the United States. Adjustment assistance has included such measures as special unemployment compensation and retraining for employees who have lost their jobs, financial assistance to companies, and grants to communities adversely affected by imports. Actually, suffering for individual groups of workers, and even whole communities, can occur for reasons other than imports, and a strong case can be made that adjustment policies should deal with these problems across the board, i.e., regardless of the cause of the change. It frankly must be recognized that the array of adjustment policies, here and abroad, have not been particularly successful thus far, and efforts should be made to make them more effective.

Some thoughts should be given to policies which do not simply shore up a depressed industry that is losing its comparative advantage, but enable the resources of that industry to flow in new and more profitable directions.

Greater emphasis should also be placed on retraining and possibly relocating displaced employees for jobs in growth sectors of the economy. What government can and should do to ease the transitions caused by shifts in world and domestic markets will remain a subject for debate and experimentation, hopefully with better results in the future.

Trade with Communist Countries

Two other trade policy issues are not new but are likely to provoke continued attention. The first involves trade with the Communist countries, where the price and availability of any product are not fixed by the market, or even by costs, but by the state. Political factors have taken precedence over economic factors in determining trade decisions with Communist countries. This has been so in case by case and year by year, in this area of U.S. trade, both export trade and import trade. This is as it should be and must be. Moreover, for the foreseeable future -- even apart from political factors such as the state of U.S. relations with the Soviet Union -- there will be limits on the volume of this trade that are set by the ability of the Communist countries to sell desirable goods in the U.S. market; that is, given the general desire of these countries for "balanced" trade, U.S. exports cannot for long exceed, in a major way, its imports; and imports are limited more by what is offered than by special trade barriers applied to goods from these countries. It would be poor policy -- and is unlikely in any event -- for the United States to depend on Communist sources for a substantial portion of its supply of any product, though exceptions may have to be made in the case of a few raw materials. Furthermore, while there have been few cases thus far, U.S. law properly provides special remedies against injury to domestic producers caused by imports from those countries, where the price may be set independently of the cost of production. Trade with Communist countries in the years ahead no doubt will continue to pose a series of specific policy choices (grain embargoes, most-favored-nation tariff treatment, exports of goods embodying high technology), but it seems safe to say, figuratively speaking, that the volume of headlines will exceed the volume of trade.

Export Financing

The second issue is export financing, meaning chiefly the operations of the Export-Import Bank.*

There is a school of thought that strongly doubts the value to the United States of any subsidy at all for export financing, even if the lack of subsidy means some loss of export sales. Besides this view, budgetary problems periodically afflict the government's attitude toward the Eximbank, its lending operations being cut back from time to time merely to reduce net budgetary outlays. As a practical matter, in a world where export business now accounts for a sizeable number of U.S. jobs -- and where the trade balance affects the dollar's exchange rate and hence the domestic price level -- there are pressures on the United States to provide export financing facilities that are competitive with those of the other industrial countries, even where subsidies are involved. The United States cannot deny itself this tool. However, international negotiations to reduce the level of subsidy are a possible alternative. If international negotiations to moderate the "credit war" do not succeed, there is a case for review by Congress of the present Eximbank facilities with a view to making them more competitive with the export credit programs of other industrial countries in such areas as the interest rate, amount financed, insurance coverage and "blended" credits which combine grant aid with export credit, although the costs as well as the benefits of such a program must be understood. In addition, an evaluation of direct export financing programs must take into consideration differences in the tax systems among industrialized countries; in particular, the use of the Value Added Tax in Europe.

---

* The Eximbank was established in 1934 to facilitate export transactions between U.S. sellers and foreign buyers through various loan and guarantee programs.

General Agreement on Tariffs and Trade

Apart from a series of specific trade decisions in all of these areas, U.S. trade policy in the years since World War II has been dominated by a series of "rounds" of general international trade negotiations, conducted under the auspices of the General Agreement on Tariffs and Trade (GATT) in Geneva. Hardly a year has passed which did not include preparation of trade legislation for Congress in anticipation of a new "round," lengthy congressional consideration of the legislation, or the negotiations themselves.

The most recent Tokyo round was concluded in 1978, and the rhythm from now on may well be different. Along with a further reduction of tariffs (which are now in general quite low in all the industrial countries), the latest round produced agreement on a new set of trading codes in such areas as subsidies, custom valuation procedures and government procurement, though it did not solve all problems in the area of nontariff barriers to trade. It seems probable that the years ahead will see a focus on the gradual development of "case law" under these codes, including numerous individual points of friction, rather than any new effort at a general trade negotiations.

It is possible that if sluggish growth and rising unemployment persist among the industrial countries in the years ahead, there could emerge a fundamental change in trade policy around the world in the direction of protectionism. Despite many fears, and a few publicized cases of new trade barriers, this has not been the case so far, as the continued strong growth of world trade testifies. The interest of the United States continues to lie in a generally open trading world.

Management of Commercial Policy

As can be seen from this staff study, trade policy now extends far beyond the issues of high versus low tariffs, or free trade versus protectionism. Yet, despite the diversity and complexity of the problems resulting from the world trade explosion, the United States, the world's largest trader, has been the only major power without a department of ministry with primary responsibility for foreign trade. Instead, a number of government agencies have been responsible for various aspects of trade policy, often involving competing aims and claims: The Department of State (overall foreign policy); Treasury (customs, dumping, and balance of payments considerations); Commerce (domestic business interests and export control); Interior (oil and mineral policy); Defense (military and intelligence policy); and Labor (adjustment considerations for U.S. workers). There are valid historical reasons for this lack of central organization of commercial policy.

The many different agencies have their counterparts in nongovernmental groups and lobbyists who have often pursued competing goals through these respective government departments. Neither the departments nor their constituents have been willing to see U.S. trade policy centralized in one office where they would have to compete on common ground. Yet, the need for a unified U.S. foreign economic policy has become increasingly apparent in the postwar world as overseas competitors have outperformed the United States in the increasingly complex area of commercial policy management. The advantages enjoyed by the monolithic negotiating tactics of Communist bloc countries are obvious, but a growing number of democratic governments also leave fewer of their decisions solely to the private sector. Many more companies are partly state-owned or dominated and the shadow of government looms increasingly in trade decisionmaking. However, it is easier to formulate a consistent commercial policy in a smaller, more homogeneous and more elitist nation than in the large, diverse and regional United States.

To help meet the problem, the Trade Expansion Act of 1962 created a new cabinet level post -- the President's Special Representative for Trade Negotiations (STR). Since that time, the strength or weakness of the office has depended uniquely on the individual who has filled it and on his personal access to the President and his influence with Congress.

The most recent attempt at an administrative solution to this problem was the establishment, in January 1980, of the International Trade Administration (ITA) in the Department of Commerce to bring together in a single agency the government's nonagricultural internationl trade functions, including export promotion, and, on the import side, administration of the antidumping and countervailing duty laws. The reorganization consolidates U.S. trade policy leadership and trade negotiations in the Office of the U.S. Trade Representative (formerly the Office of the Special Representative for Trade Negotiations) which remains in the Executive Office of the President with the Trade Representative retaining Cabinet rank.

The Commerce Department is now responsible for implementaion of trade policy in general, in addition to its ongoing responsibilities in export promotion, adjustment assistance and export control. In other words, the reorganization focuses policymaking responsibility in the Office of the USTR and vests the major responsibility for day to day operations of trade policy in the Commerce Department. Close scrutiny should be given to the jurisdictional shift of the commercial attaches in U.S. embassies abroad from State Department to the new ITA. Unless positive results -- especially on exports -- are quickly forthcoming, trade implementation should be merged with trade policy and the attaches should be administered by the Office of the USTR. It is too early to say whether this major reorganization is a success; it expands the trade role of the Commerce Department, but it remains to be seen whether this will produce a unified trade policy. It is also difficult to say whether the suggested creation of a new Department of Trade (or Trade and Investment) would be a satisfactory solution, but in the present economic climate, any added bureaucracy in the next few years would be hard to justify.

The last five Administrations have come out with strong "new" export policies, but there was never any strong follow through. In the next decade, U.S. Presidents will have to recognize the importance of foreign economic policy and the need for its coordination. In this way the role of the USTR would inevitably be enlarged, not only in access at the White House, but in strong support in Cabinet meetings where the old jurisdictional quarrels must be settled:

III

THE OIL CRISIS AND U.S. ENERGY DEPENDENCE

As the United States progresses into the decade of the 1980's, it confronts the harsh reality that the age of abundant and cheap energy has ended. The fragility of foreign supplies is once again dramatically illustrated by the Iraq-Iran conflict with its threat of widespread disruption of Middle East oil. The key to the problem is U.S. dependence on imported oil. Indeed, petroleum is the primary area of U.S. international dependence.

From 1972 to 1980, a handful of petroleum exporting countries succeeded in raising the price of crude oil from under $2 a barrel to over $30. In 1973, the Arab members of the Organization of Petroleum Exporting Countries (OPEC) embargoed oil shipments to the United States, and late in the same year, oil prices rose by more than 400 percent to $10 a barrel. At the same time, OPEC members produced and exported a lesser volume of oil from 1973 to 1979. In 1979 alone, oil prices doubled from less than $13 a barrel to more than $26 a barrel, in large part because Iranian production fell.

Today, the uneven collaboration of five great exporters -- Saudi Arabia, Iraq, Kuwait, Nigeria and Libya -- and a decline in their excess capacity, is more than enough to maintain these policies. Following OPEC price initiatives are other countries -- Great Britain, Norway, Mexico, China with its small output, and Canada with no net exports. Thus, the oil price revolution over the long term is expected to be effective (although there could be market blips caused by temporary changes in supply and demand) in part because of an increasing scarcity of petroleum resources, and in part because of the locations of these resources and the political controls over their production.

In the wake of the 1973 to 1974 oil crisis, some of the leading industrialized countries established the International Energy Agency (IEA) as an autonomous multilateral forum within the

Organization for Economic Cooperation and Development (OECD) to implement the International Energy Program adopted in 1974. This program and the IEA were attempts to strengthen cooperation on energy conservation, to coordinate research and development policies and funding, to provide an information system, and to share oil supplies in an emergency. While the 20 members of IEA have considered unified bargaining with OPEC, there is no agreement thus far, and OPEC has refused to negotiate with IEA.

World Supply

The world possesses huge oil reserves, but new oil discovery rates have declined, and there are technical, economic, and institutional as well as political constraints on world oil production. The prognosis for sluggish or declining world oil production is reinforced by a consideration of prospects in OPEC, other industrial and developing countries and the United States.*

In 1979, world production of crude oil reached a total of about 60 million barrels per day, or 22 billion barrels per year. In 1978, the World Energy Conference estimated that the size of the earth's remaining resources of conventional oils excluding oils from shales and tar sands was about 300 billion metric tons. Informed judgment is that, were limitations restricted to the cost of alternative fuels and the availability of technical and managerial capacity, the world supply of conventional oils could be expanded to 90 million barrels per day (or about 4.5 billion metric tons per year) by the early 1990's and perhaps to a range of 200 to 220 million barrels per day by the year 2000.

The controlling political limitations, however, make this expansion most unlikely. First, there is the successful policy of OPEC and other oil producers of earning more by producing less. Second, there is the continuing incompatibility between many less developed countries and the petroleum enterprises of the most advanced nations. Frequently, the experienced oil companies do not trust developing countries to observe long-term contractual arrangements and therefore are not interested in large-scale participation.

---

* The World Bank is studying the possibility of establishing a proposed energy affiliate which would concentrate on increasing conventional and renewable energy production and provide funds for exploration of new energy supplies. The idea was put forward at the 1980 Vienna Summit meeting of seven industrial countries and supported by the Bank's Board of Governors which initiated the study.

Of all the world's firmly proven and prospective crude oils, totalling 115 billion metric tons, some 68 billion are in the Middle East and 14 billion in the Communist countries. The latter may have decreasing or vanishing surpluses for export and their net exports may have already peaked (at 1.0 million barrels per day) in 1978. The OPEC group, consuming less than 8 percent of its own production, exported 28 times as great a volume of oils as the net exports of the Communist bloc even in 1978 and 1979. However -- and here is the nub of the world price squeeze -- the OPEC group produced less crude oil in 1979 and in every year from 1974 to 1979 than it was producing, at an annual rate, in the third quarter of 1973, immediately before the oil price revolution. Total proven and near prospective crude oil reserves of the OPEC group are being tapped at a rate of a little over 2 percent per year, with the stronger OPEC suppliers in no hurry to "prove up" additional reserves.

There are technical as well as political constraints on OPEC oil production resulting from greater interest among OPEC producers in maximizing the recovery rate of their reserves and in conserving light crude. They also have financial and social concerns centering on the wisdom of accumulating massive financial assets, and on the effect of these assets on the pace of internal economic and social development. But above all, the value of being an oil export country is increased if worldwide production of oil is reduced. Exporting countries (with some exceptions such as Kuwait and Saudi Arabia) are realizing that they can reduce production of a nonrenewable energy resource while the price of oil rises, and that the end result will be increased oil revenues with less production. It is a simple case of being able to produce less but earn as much or more annually over a period of time because the unit price increases as supplies become scarce and the relative price of energy rises.

In non-OPEC oil producing countries, the situation is as follows:

United Kingdom: North Sea production will peak in the early 1980's. Barring discovery of new fields, output will begin to fall in 1983 or 1984. (Norway is already restricting North Sea production.)

USSR: Available evidence indicates that in the next three or four years, the Soviet Union -- the world's largest oil producer -- may be forced to choose between curtailing oil consumption or becoming a net importer of oil. A reversal of the recent production slowdown would depend upon the discovery and development of new oil fields, but the impact of any new finds would not be felt before the early 1990's. With domestic oil production declining and demand growing, the USSR may become an increasingly aggressive competitor for access to Persian Gulf crude. This has implications not only for the world price of oil, but for national defense as well.

Developing Countries: Substantial increases in oil production will be realized, as is already visible in Mexico, Egypt, India and Malaysia. However, most of the incremental supply will be diverted to support increased oil consumption in other developing countries.

Mexico: Current Mexican efforts contemplate raising oil production to roughly 4 million barrels per day in the early 1980's. (This contrasts with current domestic consumption rates of approximately 1.1 million barrels per day.) The proximity of Mexico to the United States offers great potential for mutually beneficial trade and other arrangements. The same is true, of course, for Canada -- though there the quantities that may become available for U.S. purchase in the 1980's seem more limited.

United States: A virtually stagnant level of domestic energy production has been accompanied by an increase in energy consumption. U.S. crude petroleum output peaked in 1970 at 9.2 million barrels per day but sagged during the decade despite new Alaskan supplies. By decade's end, the down-trend appeared to be leveling out, but production during the first 10 months of 1980 -- estimated at 8.62 million barrels a day -- still was below the 1970 figure.

U.S. Consumption

Despite the Arab oil embargo, and the eightfold increase in oil import prices, U.S. energy consumption continues to be petroleum-intensive. The result has been net energy imports rising from 13 quads in 1973 to 16 quads in 1979, nearly all of which took the form of petroleum products. (One quad is the energy equivalent of 180 million barrels of oil.)

In 1979 as in 1973, 47 percent of the energy consumed in the U.S. was petroleum, but the percent of this petroleum imported from abroad jumped from 36 to 44 percent. Imports as a percentage of U.S. consumption rose from 19 percent in 1960 to 24 percent in 1970 and then almost doubled to about 43 percent in 1979. Imported crude oil is an increasingly important source of the petroleum consumed. In 1973, 54 percent of net energy imports consisted of crude oil. By 1979, crude oil constituted 80 percent of U.S. net energy imports. (Parts of this increase is attributable to the displacement of refined product imports by domestic products because of the increase in U.S. refining capacity.) In only 11 years, the cost of U.S. imports of crude oil and refined petroleum products has increased by over 25 times. It is estimated that this import cost will rise to something in the general range of $100 billion in the year 1980. By 1978 -- five years after the Arab oil embargo -- OPEC was the source of 69 percent of U.S. petroleum imports, up from 48 percent in 1973.

Since 1973, total U.S. energy consumption has risen, in spite of relatively successful conservation efforts and more efficient use of energy, particularly in the industrial sector. The U.S. remains increasingly dependent upon imported oil, with OPEC the critical supplier.

These facts have a significant bearing on U.S. productivity, since energy availability and energy prices have a central role in the process of economic growth and productivity improvement. Oil price increases tend to erode productive efficiency and the rate of productivity growth.

The United States should, of course, direct its policies toward reducing U.S. dependence on foreign oil. It can do this at home by encouraging further conservation, greater production from conventional energy sources, and increased research in new technologies and new energy sources.

On the international front, the United States can actively seek access to more secure foreign energy sources, such as Mexico and Canada, at more stable prices. It can also encourage the development of oil and natural gas exploration in the developing countries through technical assistance and the equity participation of U.S. enterprise.

IV
RELATIONS WITH DEVELOPING COUNTRIES

The importance of the developing countries to the international economic system and specifically to the U.S. economy has grown tremendously in recent years. The energy crisis dramatized American dependence on third world countries, which supply about 40 percent of the oil consumed in the United States as well as other strategic raw materials. These countries, however, are also growing markets for U.S. exports. In several instances, the increased U.S. industrial exports to the non-oil producing developing countries have been financed by sharp increases in their international loans. (The general pattern of this rising debt is discussed in Chapter V.)

Many of these countries, with a sizeable government-owned sector, are interested in building up their own export bases. More and more trade and investment decisions are made through quasi-political negotiations between governments and corporations instead of being based on traditional marketplace forces. So, while most of the developing countries provide opportunities for U.S. private investment, the benefits of investment from the U.S. Government point of view (as opposed to the corporate) are often ambiguous. (For more on U.S. investment abroad, see Chapter VI.) Economic conditions in third world countries now have a significant impact on global economic growth. For this reason, U.S. foreign economic policy will have to pay increasing attention to relations with the less industrialized countries.

Developing countries are in no sense a single group, but fall into various categories with different concerns and problems. On the basis of 1978 GNP, the World Bank divides developing countries into: Low-income with a GNP per person of $360 and below; and middle-income with a GNP per person above $360. The 13 members of OPEC fall into a separate category. Among the middle-income group, there are the advanced developing or newly industrialized countries (NICs) such as Hong Kong, Singapore, Taiwan and South Korea as well as Mexico and Brazil, which are also rich in natural resources. In 1959 there were 96 independent nations in the world; in 1980 there are 167, and all of these newly independent countries are considered to be "developing." Of these, 119 are members of the so-called Group of 77, also referred to as the "South," as distinguished from the industrialized non-Communist states of the "North."

New International Economic Order

Over the years, the focus of developing countries has shifted from aid to trade and investment, and broadened to the exploitation of ocean resources, increased world food production and energy problems. These widening economic and political concerns of the third world are reflected in the movement for a new international economic order (NIEO). The basis for NIEO lies in the third world's dissatisfaction with what it considers inequities and discrimination in the global economic system. The program, first broached at the United Nations in 1974, has three main goals: to increase the transfer of resources from the developed to the developing world; to achieve greater economic independence for the developing world; and to gain a larger voice in international forums.

Developing countries are concerned with industrializing and exporting manufactured products on preferential terms, primarily labor intensive consumer goods. NIEO members also want access to technology on more favorable terms and a greater decisionmaking role in the activities of multinationals and private investors in their countries. While some of the planks in the NIEO program presently are opposed to the United States point of view, and many of them are at least controversial, the United States does understand many of the concerns which they reflect and it will have to give more attention to the politics and policies of handling these growing demands.

Aid to the Poorest

In the last three decades, the rate of economic progress in the various developing countries has been significant in the aggregate, although the rate of progress between individual countries differs widely. In general, average incomes have doubled since 1950 and literacy and life expectancy have increased appreciably, but absolute poverty measured in hunger, disease, illiteracy and high mortality rates is still widespread.

The development of human resources -- especially for women and children -- seems to be consequential rather than causative in relation to economic growth in most of these countries although more educational opportunities, better nutrition and health as well as family planning are all closely related to poverty reduction in the long run. Traditionally, the United States has been a supporter of human development efforts here and abroad, in part because support for the poor has a legitimacy that transcends culture, religion, ideology and class. This is particularly true where children are involved. The idea that every child should have a fair start -- without the handicaps of disease, illiteracy and malnutrition -- predates the founding fathers.

About 800 million people now live in absolute poverty at the margin of subsistence; most are in South Asia and Sub-Saharan Africa, with perhaps two-thirds in four countries: India, Bangladesh, Pakistan and Indonesia. The World Bank estimates that about 600 million will still be in this condition by the year 2000. For these low-income developing countries, the United States has immediate moral and humanitarian concerns in addition to long-run economic and political interests. The United States provides both bilateral and multilateral assistance to these countries. In recent years, the United States' bilateral foreign aid program, which now amounts to about $1 billion a year, has grown very little with Congressional and public support apparently weakening. In the past 10 years alone, the real value of total United States aid has been cut in half. Often it has been left to the private non-governmental organizations to take the initiative in aid, for example, to Asian refugees.

On the multilateral side, the International Development Association (IDA), established in 1960 and administered by the World Bank, is the principal channel targeted toward the poorest, with the rural poor the chief beneficiaries. Of a total $5.8 billion loaned by the Bank in FY 1980, $1.4 billion in loans were from the IDA. The United States has provided over 30 percent of the total funding for IDA, which extends loans or "credits" at low interest rates of 0.75 percent and long repayment periods of up to 50 years. For the 1980-83 period, the projected U.S. share is reduced somewhat but, at over $3 billion, is still by far the largest contribution. Germany and Japan have increased their shares to 12.5 percent and 24.7 percent of the total, respectively.

Trade with Developing Countries

While "foreign aid" is and will continue to be essential, U.S. development policy in the future is more likely to emphasize trade and investment opportunities. Perhaps the greatest immediate contribution the United States can make to the economic advancement of the developing countries is to maintain and expand markets for their imports. The U.S. record in according market access to these countries has been good, despite some specific import restraints on shoes, textiles and televisions: approximately a quarter of U.S. imports are from non-OPEC developing countries.

Despite the positive effects of this trade for the United States, growing imports of manufactured goods from the middle-income developing countries and even from a few low-income countries will pose a problem when their volume and variety begin to have a larger impact on U.S. industry, especially because of their lower labor costs. These competitive exports from countries such as South Korea, Taiwan, Hong Kong and Singapore will require adjustments by U.S. industry and occasionally the application of specific remedies, the scope of which has been enlarged in law, code and custom over the last six years. Increasingly, in considering causes and solutions to apparently disruptive trade impacts, it is important to remember that import trade is with growing frequency not just trade with foreigners. The television set from Taiwan may be the product of an expatriate manufacturer who presumably brought capital and knowledge from the United States where some of the resultant profits will eventually be remitted.

Considering all these complexities, it must be granted that U.S. policies to date have accorded the developing countries access to selling in American markets on a very large scale. U.S. policy should be to continue this access -- which has been crucially constructive in their development to date -- with an increasing eye to smoothing out resulting community or market disruption.

Commodity Agreements

Of the various issues involved in trade between the Third World and the United States, perhaps none is more troubling politically than the exports of agricultural and mineral commodities from developing countries. *

Concerned that their commodity exports yield stable and remunerative prices, the resource-rich countries want negotiated agreements on specific agricultural or mineral commodities. This policy, perceived by the Third World as a way of restructuring the international economic system so as to achieve a larger share for its raw materials, has been a focal point of NIEO. Given a choice, however, many developing countries are more interested in exporting manufactured products as their industrialization gets under way. Already, a striking feature of current export trade has been the declining proportion of primary commodities in relation to total annual exports.

---

* See "The North-South Dialogue and Its Bearing on U.S. Commodity Policy," by Bernard Blankenheimer, printed in Volume IX, SSEC.

U.S. policymakers, the great majority of whom continue to oppose most commodity agreements, consider that the real aim is not price stabilization and moderation of short-term fluctuations but rather an ever higher price and increased total export revenues. However, the United States has joined the 5th International Tin Agreement and Congress has authorized a U.S. contribution to the buffer stock operated by that Agreement. The United States has also joined, with Congressional approval, the new International Rubber Agreement, which will use a different kind of buffer stock device. Price stabilization through buffer stocks is generally viewed as preferable to export or production restraints, but experience to date with the few commodity agreements, such as the tin-agreement -- which have used buffer stocks -- is not encouraging. Prices have risen in times of shortage and the buffer stocks have not been able to prevent these increases.

Given the international inflationary environment, and the historical experience of existing commodity agreements to only "stabilize upward," the United States should differentiate buffer stock mechanisms, and other features of future agreements, to avoid existing institutional pressures to raise prices.

Book II of

THE INTERNATIONAL ECONOMY
U.S. Role in A World Market

Contains Chapters V, VI, VII
and supplemental materials

The International section of the Special Study on Economic Change, Joint Economic Committee, is one of 10 sections of the SSEC. Orders for this study may be placed by contacting:

Joint Economic Committee
Room G-133
Dirksen Senate Office Building
Washington, D.C. 20510
Telephone: (202) 224-5321

The International Economy

U.S. Role in A World Market

Book II

Joint Economic Committee

Special Study on Economic Change

A staff study

December 1980

(419)

Book I of

THE INTERNATIONAL ECONOMY
U.S. Role in A World Market

Contains Chapters I, II, III, IV

V

THE CHANGING WORLD OF INTERNATIONAL FINANCE

At the end of World War II, the major financial powers, particularly the United States and the United Kingdom, established a new kind of gold standard. Under the Bretton Woods Agreement of 1944, the value of other currencies was stated in terms of dollars, and dollars were in turn linked to a fixed quantity of gold, at $35 an ounce. Under this system the dollar became the principal source of international reserves.

The Dollar as a Reserve Currency

The structure of the Bretton Woods system contained several serious flaws. Pressures for adjustment fell largely on countries experiencing balance of payments deficits rather than on those in a surplus position. Exchange rate changes, though permitted by the system, proved politically difficult, even when clearly needed. It was particularly difficult for the key currency country, in this case the United States, to react effectively to a persistent payment imbalance, and it was almost impossible to devalue the dollar.

A steady expansion of international reserves was needed to finance a rapidly growing volume of international transactions. Persistent deficits could supply a steady stream of dollars, but also acted to reduce the durability of the dollar as a financial asset.

The Bretton Woods system was under attack throughout the 1960's. The demise of the system came when dollar convertibility into gold was abruptly terminated in August 1971. By 1973, the principal financial powers had abandoned the relatively fixed rate system of Bretton Woods for one of flexible or freely floating rates with currencies moving in response to supply and demand for each currency.

There had been some expectation that the need for international reserves would be greatly reduced under the flexible exchange rate system, but that has not been the case. Part of the reason is that nations have continued to feel the need to intervene in foreign exchange market trading which requires reserves.

The dollar is still the world's principal reserve asset and is likely to remain so through the coming decade, chiefly because the alternatives to dollar assets appear quite limited. At the same time, the world appears to be moving hesitantly in the direction of a multi-reserve currency system. The movement to flexible exchange rates has made it desirable for central banks as well as private corporations to reduce their exchange rate risk by holding a portfolio of currencies. Next to the dollar, the largest "reserve currency" -- private and public -- is probably the pound sterling, but the United Kingdom, understandably, does not want to play a major role. Germany, Japan and Switzerland, the only other major candidates for shared reserve responsibilities, have been reluctant to accept the limitations that come with managing a reserve currency, but the combination of large current account deficits, energy dependence, and the financial plans of the OPEC members with an investible surplus, has begun to change German and Japanese practice.

The world may also turn again to the IMF to provide a managed increase in world reserves. Dollar instability in the late 1970's had spawned discussion of a new IMF facility where official holders of dollars could exchange them for an updated version of Special Drawing Rights (SDRs). The proposal for this substitution account stalled over questions of how liquid the SDRs would be, what interest rate they would carry and who would bear the risk of loss should the dollar depreciate relative to the SDR. Dollar recovery and American financial restraint in 1979 and 1980 reduced the pressure for movement away from the dollar, but the proposal could be renewed at a later date.

Flexible Exchange Rate Policy *

The purpose of exchange rate policy should be to facilitate international transactions at a level and composition which result in a desired balance of payments. The optimum balance may be in surplus or in deficit, depending upon the phase of the business cycle, special factors such as oil imports, or the state of the country's development and its need and attraction for imported capital.

---

* For a more detailed discussion, see the following two papers in the SSEC study: "Monetary and Fiscal Policy with Adjustable Exchange Rates" by William H. Branson, and "International Liquidity Issues and the Evolution of the International Monetary System" by Thomas D. Willett.

There is an additional burden on the United States, as the dollar has a role beyond simply that of a national currency. Because the dollar is still the world's major reserve currency, and the vehicle by which many transactions by third countries are carried out, changes in the dollar exchange rate can have worldwide effect. Thus, the Canadian dollar was allowed to float from 1950 to 1962 without upsetting confidence in the world economy. A floating U.S. dollar, however, affects the purchasing power of persons and firms in every trading country. Fortunately, there is ample opportunity for traders to hedge in the foreign exchange markets.

In its simplest form, there are two parts to an exchange rate policy: What the existing rate should be, and the conditions under which the existing rate should be allowed to change. Factors which affect an appropriate existing rate include the composition of trade flows, elasticities of demand for various products, and domestic conditions such as the unemployment rate and inflation rate. However, this "appropriate" rate would be the same whether one operated under a fixed or a floating rate regime. What is new about floating rates, therefore, is that they change under different conditions than do fixed rates.

During the 28 years of the Bretton Woods system, "fundamental disequilibrium" was the term used to describe the conditions under which changes in exchange rates were permissible. Members of the International Monetary Fund were to refrain from changing the par value of their currency except to correct a fundamental disequilibrium. Under a floating rate regime, changes in exchange rates are generally determined by market perceptions about underlying economic trends, or about the intentions of government either in correcting those trends or in intervening in the exchange markets.

The important difference in the two systems is that they pose a different set of constraints for domestic economic policy. Under fixed rates, international economic events posed constraints on domestic economic policy largely through two related channels: Balance of payments developments and gains/losses in monetary reserves. In other words, domestic policy remained relatively free from international pressures, so long as these pressures did not exceed the ability of a nation's central bank to keep its currency within its allowable margin of exchange rate fluctuation. *

---

* Even under fixed rates, exchange transactions between the currencies of members were allowed to differ from the par value by 1 percent on each side of par.

In the U.S. case, the ultimate constraint was the level of the gold reserves.

The hope of those who supported a floating rate regime was that domestic policy would be free of these kinds of constraints. The floating rate system was theoretically designed to yield automatically a value for each currency which would ultimately result in balance-of-payments equilibrium. Policymakers have come to learn, however, that exchange rate appreciation or depreciation do constitute a major restraint on domestic policy. Furthermore, since exchange rates are the link between prices and costs in the United States and in other countries, a floating system means that the link is more immediate, and that the connection between domestic and international policy is more direct. This means that domestic monetary policy changes -- especially changes which affect interest rate levels -- show up rapidly in the form of exchange rate changes.

Fiscal policy, too, is closely linked to the dollar exchange rate. Under flexible rates, domestic expansion led by fiscal policy changes directly affects exchange rate expectations, which in turn erode the value of the dollar in the foreign exchange markets. This depreciation can take place even before the fiscal policy changes have had a measurable effect on aggregate demand. Thus, import prices, and the prices of domestically produced goods competing with those imports, can influence the rate of inflation before domestic fiscal policy has had a chance to spur employment. In this sense, according to studies produced for the SSEC, the inflation/unemployment tradeoff is worsened under a flexible exchange rate system. *

Exchange rate policy for the United States, then, encompasses elements of domestic as well as international policy. The present system demands greater attention to price stability than previously.

Despite this problem, virtually all economists agree that the major changes in the international economy since the OPEC oil price hikes in 1973-74 could have been accommodated only with a floating exchange rate system. There is no way that IMF member governments could have arrived at realistic fixed exchange rates in a setting where the composition and volume of trade flows, and the prices of individual products, were changing so rapidly from month to month. What was necessary at that time was an international

---

* See especially "Stabilization Policy in the Open Economy," by Rudiger Dornbusch; also "Monetary and Fiscal Policy with Adjustable Exchange Rates" by William H. Branson, Volume IX, SSEC.

exchange rate system where changes in domestic economic conditions could be translated rapidly and efficiently into exchange rate changes. The death of the Bretton Woods system came not a year too soon.

In its administration, the system of flexible exchange rates has not been ideal. The economist's model of a system where changes in underlying conditions are translated efficiently into exchange rate changes is obviously not taking place in the real world. Most economists predicted that rate changes would ordinarily be gradual, and approximately equal to differences in inflation rates between the United States and its major trading partners. But equilibrating forces have not been as automatic as had been hoped and there have been some unexpected turns. For example, between March 1973 and September 1975, there were six occasions when the dollar exchange rates for most of the major currencies rose or fell sharply in the course of a few months, sometimes by 20 percent or more. At the end of the 30-month period, the dollar exchange rates for these currencies were not substantially different from what they had been in the beginning. Underlying economic conditions do not change so much so quickly, nor do they reverse themselves so completely. It is probable that the exchange rate gyrations served simply to clear markets dominated by speculative expectations. *

In addition, many third world countries have linked their currencies to the currency of a major industrial country which is a major trading partner in order to avoid the inevitable price distortions which would result if the link were not so direct. This means, however, that changes in the dollar exchange rate could affect the value of the Pakistani rupee and the Venezuelan bolivar against European currencies and the yen even if Pakistan and Venezuela were not experiencing major shifts in underlying economic conditions.

Another assumption by economists was that trade flows -- the major evidence of international competitiveness -- would follow changes in exchange rates and thus adjust a country's balance of payments at an equilibrium level more or less automatically. This assumption, also, was mistaken. A sharp depreciation of the dollar vis a vis other major currencies could show up in domestic price changes as much as trade flows, as domestic producers who compete with foreign manufacturers simply raise their prices rather than

---

* Oscar Gass estimates that speculation in exchange rate "position taking" activity probably is amounting to around $70 trillion. See "The International Economic Posture of the United States," Chapter 7, on his discussion of "Floating," printed in Volume IX, SSEC.

attempt to gain additional market shares. This inflationary effect of currency depreciation has been shown, as a practical matter, to be the more dominant one over the short term. What this means is that many imports -- which should become more expensive and thus less attractive with depreciation -- instead become no less price competitive than the domestically produced product, but still are more expensive. This results in a worsening of the balance of payments over the short term, even though exchange rate depreciation is probably helpful over the long term. This effect is a practical reality which must be taken into account by policymakers. It complicates the balance of payments picture, since foreign exchange markets will respond to these short-term phenomena. For example, the sharp depreciation of the dollar in 1977-78 aggravated rather than helped the U.S. balance of payments during that period.

It was also assumed that government intervention or nonintervention in the foreign exchange markets would be accurately interpreted by the market participants, thus reinforcing exchange rate stability and helping to adjust automatically these countries' balance of payments. However, the enormous fall of the foreign exchange value of the dollar between the end of September 1977 and the end of October 1978 was proof that the passive exchange rate policy of the U.S. monetary authorities was being wrongly interpreted. It took a set of major changes in U.S. policy -- beginning on November 1, 1978 -- to bring about exchange market conditions which more closely reflected the true value of the dollar vis-a-vis other important currencies. Apart from the sometimes perverse effects of intervention or nonintervention, there is also the enormous impact of capital flows that can occur for a variety of reasons, of which interest rate differentials are an important one. As another example of why capital can move, a sharp increase in political risk in Europe could lead to large flows of investment into the United States which in turn would increase the international value of the dollar; U.S. exports would then become somewhat less competitive. The fact is that capital flows, whatever their underlying motivation, can have a sharp impact on exchange rates and thus competitiveness, regardless of trade or current account balances.

Three major conclusions can be drawn from the evidence:

First, a pragmatic foreign exchange rate policy will demand greater exchange rate oversight by U.S. monetary authorities under the present system than under any system of fixed or partially fixed rates. While the Federal Reserve should not intervene to counteract changes in underlying economic conditions, such a stricture begs the operational question of how the Fed is to treat speculative movements which sometimes can reach massive proportions. The evidence suggests that widely fluctuating exchange rates have an inflationary effect on the domestic economy; therefore, exchange rate stability is as much a matter of domestic as of international policy. This study cautions against taking an ideological view on the issue of Federal Reserve intervention because the sometimes volatile and contradictory nature of foreign exchange markets does not lend itself to firm rules about policy or rate behavior.

Second, the link between U.S. inflation and world economic instability is now more direct. This places an extra burden on domestic policymakers to pursue a road of reducing price inflation even at the expense of the more immediate attainment of some other policy goals. Other staff studies of the SSEC outline a course of action, utilizing fiscal and monetary policies, for improving the price picture over the long run. In this respect, the aims of domestic and international policy are roughly coincident.

Third, the world is still a long way from an ideal monetary system in which world aggregate demand and supply -- and, thus, worldwide inflation -- can be controlled through some form of international monetary cooperation or supranational monetary authority. For perhaps the next several decades or more, the world must depend on an imperfect system while getting used to the fact that the freedom of domestic economic policies of every country is constrained under the present system of flexible exchange rates, possibly even more than previously.

The Eurocurrency Markets

Closely linked to the issues of the efficiency of flexible exchange rates and the role of reserve currencies is the growth of Eurocurrency markets during the 1970's. * Of the many changes in international finance, none is as widely visible and as little understood as the Eurocurrency market. It is an important wild card added to the international financial game that has ramifications for policy implementation confusing to companies and countries alike as well as to central and multinational banks. It is no wonder that some of the old rules of thumb are no longer dependable. There is a new type of international money flowing freely around the world which is unresponsive to many of the old policy tools, including exchange controls.

---

* For a more extensive analysis of this subject, see Chapter V, "Dynamic Transformation of the World Economy: The U.S. Policy Response," by Richard D. Bartel, Volume IX, SSEC.

The recent interactive development of the Eurocurrency markets, multinational corporations and international banks has resulted in an electronic communications network spanning the globe and functioning virtually 24 hours a day. The locus of decisions concerning a multitude of economic transactions shifted from the national to a global level that affected all manners of operation on a worldwide scale. The multinational banks were the instruments which changed the structure of global banking and finance, just as multinational corporations altered the structure of global production. This institutional and market network has greatly enhanced capital mobility and broadened opportunities for placing and borrowing funds at the most advantageous rates.

The gross size of the Eurocurrency markets -- including liabilities to nonbanks, central banks, and other banks -- rose fourfold from 1970 to some $460 billion in 1975 and more than doubled to about $1,235 billion in early 1980. Netting out interbank transactions, the growth picture remains the same, although the absolute size is smaller: net claims quadrupled from 1970 to $250 billion in 1975, and then rose to $630 billion by early 1980. Eurodollars now constitute roughly 75 percent of total Eurocurrency liabilities.

Basically, the common denominator of all Eurocurrencies is that they are deposited outside of their country of issue. Dollars deposited in London, marks deposited in France, or yen deposited in the Bahamas are all conventionally referred to as Eurocurrency deposits. These funds have become a source of borrowed reserves for deficit countries, as well as an investment outlet for the central bank reserves of small countries and the investable surplus of OPEC countries. Thus, in the last decade, these markets and the multinational banks have become increasingly involved in financial and foreign exchange operations which were traditionally the province of central banks and international financial institutions, such as the IMF. This is a significant development quite apart from the extraordinary growth of the Eurocurrency markets and their increasingly central role in financing private trade and investment transactions around the world.

The implications for national economic policy are cloudy but of potentially great importance. Many of the conventional instruments of economic stabilization, taxation and regulatory oversight cannot reach some of the operations of global banks and non-financial corporations. Indeed, they often choose the multinational route as much to evade regulation * and policy restraint as to enhance their corporate efficiency. * *

International Banks and Recycling

As American multinational corporations spread around the globe in the 1950's and 1960's, the large American banks began to follow. By the decade of the 1970's, American based multinational banks (MNBs) could be found in every financial capital of the world. They are an important part of the Eurocurrency market and played a leading role in recycling the OPEC surpluses generated in the 1970's.

The sharp jump in world oil prices in 1973 created huge current account surpluses for the OPEC group. At the time, there were forecasts that the international financial community would be unable to deal effectively with surpluses of that magnitude. The bulk of the OPEC surplus went into very short term, sometimes overnight, deposits while the private commercial banks continued to make longer term loans. The one silver lining in the oil cloud was that OPEC, like other cartels, was expected to fall apart in the not too distant future.

Neither prediction proved to be correct. To date the international financial system has managed to recycle the OPEC surplus, but there is cause for concern that third world debt, possibly exacerbated by stagflation, could eventually strain the Western banking system -- a system which is the source of more than half of the rapidly pyramiding debt of the poor countries. Already Zaire, Sudan, Turkey, Gabon, Peru, Jamaica and Nicaragua have had to ask for a rescheduling of their debts. * * *

---

* For instance, in 1968-1969 U.S. commercial banks avoided the impact of the U.S. imposed interest rate ceilings by apparently shifting some deposits to the higher yielding Eurocurrency market and then borrowing heavily from their overseas branches. Eventually, the Federal Reserve Board responded by imposing reserve requirements on overseas borrowings.

* * See "Multinational Corporations: Current Trends and Future Prospects," by Robert G. Hawkins and Ingo Walter, in Volume IX, SSEC.

---

* * * Increasingly difficult reschedulings may be in the offing. Zaire's debt is only $234 million, but Brazil's foreign debt is approaching $60 billion and that nation needs to pay $7.5 billion in amortization and $5 billion in interest this year.

The ambitious development plans of all the non-oil developing countries, plus their rising oil import bills in a period of worldwide recession, have resulted in a steep rise in their foreign debts. Increased borrowings are still needed to offset escalating oil prices and higher prices for food imports and vital capital goods. By the end of 1979, these debts totaled $376 billion, up from $142 billion at the end of 1974. Two-thirds of these loans were from private, non-governmental sources and were concentrated in a dozen countries, including Brazil, Mexico, South Korea, Venezuela, the Philippines and Indonesia. Primary responsibility for the debt problem must be laid to rising oil prices. For example, in 1973, Brazil paid the equivalent of 12 percent of its export earnings for oil and India 22 percent. In 1980, these figures are estimated to jump to 50 percent for Brazil and 60 percent for India. Developing countries are asking governments, the multilateral institutions and private banks for more and easier credit to enable them to cope with increasing economic demands.

The U.S. Government has been a major source of finance for the developing countries, with $34.5 billion outstanding in mostly long-term loans to 86 non-oil developing countries at the end of 1978. *

U.S. private banks also hold a large amount of developing country debt. For 32 of the 86 non-oil countries (the only ones for which figures are available) U.S. banks, excluding foreign branches, had $31.6 billion in claims outstanding as of June 30, 1979. Total worldwide claims, excluding foreign branches, were $77.7 billion, a figure that covers not only these 32 countries but also other developing nations. It should be noted that some banks derive a significant portion of their income from these foreign lending activities.* *

Although the world adjusted to the initial shocks of 1973, aided by the big expansion of private bank lending, the sharp OPEC price increases in 1979 and 1980 have raised new questions about the stability of the world financial system. The U.S. Government should continue to play a leadership role in this area. Private banks

---

* Some of these loans stemmed from foreign aid programs and some from Export-Import Bank financing of U.S. exports.

---

* * See Chapter 8, "The International Economic Posture of the United States," by Oscar Gass, printed in Volume IX, SSEC.

are not in the favorable position they enjoyed earlier in the 1970's. Therefore, the recycling process must increasingly be accomplished through international institutions and governments. This should not necessarily mean an enormous increase in worldwide credit creation and inflation. Inflation may reduce the value of outstanding debts, but it also leads to even higher oil prices. Rather, the country risk associated with this borrowing should be shifted as much as possible directly to the OPEC surplus countries or to multilateral institutions, while fundamental adjustments are made in the deficit countries through substitution of domestic energy production or the development of export industries. At present the risk is disproportionately borne by private banks holding short-term liabilities which are backed by long-term credits. Whether by design or not, U.S. banks have decelerated their lending to non-OPEC developing countries in the last two years, in contrast to the accelerated lending by foreign banks. Given the integration of international banking operations, however, problems with foreign banks can spill over to American banks. Thus, U.S. efforts to shift more of the ultimate country risk to OPEC should be organized with the close support of other major banking centers.

The international financial system is yet another realm of economic life where America is now closely tied to the vagaries of the world economy. The weak financial ties and limited trade dependence were the fences that created the good economic neighbors of the past. They no longer exist.

VI

U.S. INVESTMENT ABROAD

International investment involves a huge volume and variety of activities by American interests abroad. It has also brought a sizable, though smaller, inflow of competitive foreign enterprises into this country.

For the year 1979 alone, the *increase* in U.S. private assets abroad is estimated at $58.5 billion, while the increase of foreign private assets in the United States is estimated at $49.1 billion, most of it portfolio investment rather than direct investment by foreign corporations. In the past 11 years of worldwide inflation, U.S. *net* income from international investment (i.e., the net accrual from abroad to Americans after deducting the U.S. accrual to foreigners), has quintupled, from $6.0 billion in 1968 to $32.3 billion in 1979. Additional to the $32.3 billion, but closely connected with the foreign investment, the U.S. received *net* international income in 1979 of $5.7 billion from royalties and fees. U.S. foreign trade is also, in substantial part, related to these international investment activities.

The flow of American capital overseas falls into four major categories: (1) multinational corporations -- U.S. private manufacturing, mining, petroleum, and service firms with direct and controlling ownership of producing or servicing facilities overseas; (2) private banking -- U.S. banks and other financial institutions providing financial services to foreign customers through their U.S. headquarters, foreign branches, and foreign subsidiaries; (3) portfolio investment -- American individuals and businesses holding foreign securities and other noncontrolling ownership interests; and (4) foreign assistance -- U.S. Government, both directly and through multilateral development banks, lending money to foreign governments, and, on rare occasions, to foreign business entities.

This section deals largely with multinationals, since the treatment of other aspects of U.S. investment abroad is found elsewhere in this staff study.*

At the beginning of the 1980's, American attitudes on foreign investment appear to be shifting with Americans generally less supportive of investing overseas than they were in the postwar years three decades ago. One reason is a growing consensus that the United States should increase the share of the national income devoted to domestic investment; even in its best recent years, the U.S. economy has not approached the domestic investment ratio of most other advanced OECD countries. The United States requires greatly enlarged domestic investment in energy supplies if it is to become more self-sufficient in this area. Further, the recent U.S. slowdown in productivity growth may suggest that more capital should be retained and invested in this country. Those who favor a restrained policy toward U.S. investment abroad would curtail current tax advantages for foreign investment and eliminate U.S. Government guarantees of private investment abroad through OPIC, the Overseas Private Investment Corporation.

Another view is that the United States no longer has a realistic option to discourage the trend toward overseas investment even if it were desirable. While governments can still place obstacles to the movement of capital, technical information, or managerial advice, they cannot do so very effectively under modern technological conditions. Despite difficulties, the prospect is that investment abroad, particularly through multinational firms, will continue to grow. Rather than discouraging investment abroad, the United States may be better served by encouraging investment at home through more advantageous tax treatment of savings, depreciation, and profit, and smaller amounts of Federal borrowing.

Multinationals and the U.S. Economy

The fabric of American economic life is now closely bound to the spread of multinational enterprises.* Of the 300 largest manufacturing firms in the United States, almost all have branches or subsidiaries in several foreign countries. These same firms account for about two-thirds of the goods produced in the United

---

* For an interesting and more complete discussion of American attitudes about U.S. investment abroad, see Chapter 6, "The International Economic Posture of the United States," by Oscar Gass, printed in Volume IX, SSEC.

States. A great deal of America's international trade takes place between the home office of American firms and foreign affiliates.* Many of the largest American manufacturing firms earn a substantial portion of their total corporate profits from their overseas operations. In addition, more than 80 percent of U.S. earnings from foreign licenses or royalties come from the overseas affiliates.* * American banks have followed their manufacturing customers overseas and have now become major participants in overseas lending to foreign governments and firms.* * *

The multinational corporation is hardly a new phenomenon, tracing its history back to the British East India Company and beyond. But the American-based multinational corporation did not become a major economic force until after World War II, although there have always been sizable U.S. investments in Canada. American capital, technology, and management skills poured across the Atlantic to aid and stimulate the industrial resurgence in Europe. The common external tariff of the European Common Market coupled with European recovery encouraged American firms to supply the European market through manufacturing subsidiaries located there.

The 1960's saw a further spurt of American foreign direct investment as an overvalued dollar discouraged American exports and made the acquisition of foreign assets more desirable. While American firms continued to invest in raw material development throughout the world, they also invested heavily in manufacturing facilities, not only in Europe, but also in Latin America and the Far East.

In the early 1970's, dollar devaluation, the sharp jump in energy prices, and an increase in global political instability slowed the spread of American-based multinational firms. However, existing subsidiaries continue to expand within their present structure, including the addition of new product lines.

---

* See, "The Multinationalization of U.S. Business: Some Basic Policy Implications," by Raymond Vernon, printed in Volume IX, SSEC.

* * cf., "Multinational Corporations: Current Trends and Future Prospects," by Robert G. Hawkins and Ingo Walter, printed in Volume IX, SSEC.

* * * See Chapter 6, "The International Economic Posture of the United States," by Oscar Gass, printed in Volume IX, SSEC.

The 1970's also marked the growth of multinational firms based in Europe, Japan, and the third world. Many of these European- and Japanese-based firms are now important factors in the domestic American market.

For many years, the debate about American-based multinationals focused on whether they were good for the host country where the investment was made. The benefits in terms of capital, technology, and management skills were clear, but there were certain liabilities. Europe feared that her high technology future was being preempted by American firms which already controlled a substantial share of the European market. Japan persisted in limiting the participation of multinationals in the domestic Japanese market; * high technology American firms were either prevented from establishing manufacturing facilities in Japan or admitted only after a broad sharing of technology. Gradual relaxation of Japanese limits on capital investment came only in response to intermittent but intense American pressure. However, the acquisition of an existing Japanese firm by a foreign multinational remains virtually impossible under current Japanese law. * *

American-based multinationals have been criticized sporadically for their role in the developing world. The U.S. Government's emphasis on the private firm as a major engine of industrial development in the third world was one factor in a tremendous increase in foreign direct investment in the developing countries. This brought with it both benefits and problems. Some critics argued that the sophisticated, capital-intensive techniques imported by foreign firms were not appropriate for countries where capital resources were limited but the supply of low-skilled labor virtually inexhaustible. Foreign-based multinationals were also accused of distorting domestic economic policy in many developing countries. Because of their ready access to foreign capital, multinationals could frequently avoid the impact of a domestic credit squeeze. For this reason, a prevalent fear in Latin America, for example, was that restrictive domestic monetary policy could lead to the gradual takeover of domestic industry by foreign firms.

---

* See, "U.S. Trade Considerations," by H. William Tanaka, printed in Volume IX, SSEC.

---

* * United States and Japan: Competition in World Markets: Alternatives for the United States," by William Rapp, printed in Volume IX, SSEC.

Whatever the merits of these claims, the multinationals initially were not anxious to establish manufacturing facilities in the developing world but, in some areas, particularly in Latin America, they were faced with the option of doing so or losing the market altogether.

By the early 1970's, the terms of the debate over multinationals had begun to shift. Organized labor in the United States led the way in questioning the effect of American-based multinationals on American industry. In the 1960's, the spread of the multinational had been attributed, in part, to a natural product cycle in the development of new goods. High technology items would first be developed for the affluent American market. In the early stages of production, the new goods would require the abundant American technical resources and high skill level of American labor. As the demand for the product grew and the production process became standardized, manufacturing could be expected to spread overseas to take advantage of less expensive (and lower-skilled) foreign labor.

As Europe and Japan recovered and as a number of developing countries established manufacturing bases, U.S. labor was concerned that American inventions would be taken directly from the laboratory into foreign production. In effect, they feared a technological cycle without an American product. The foreign practices that encouraged direct investment but discriminated against American exports were also criticized.

There were some indications that, in fact, the spread of American multinationals had reduced the ability of the United States to conduct domestic economic policy, particularly insofar as it concerned corporate investment. As foreign governments moved to increase their control over foreign-based multinationals, they inevitably gained some influence over decisions made by the American parent. For example, foreign incentives or regulations may encourage an American firm to invest, or to export to the United States a certain quota of its allowed Brazilian production.

Multinational Banks

The spread of the American-based multinational corporations has been paralleled by the growth of multinational banks and the emergence of a large Eurocurrency market. Domestic American monetary policy could be partially subverted by flows of funds between parent banks and their overseas branches and subsidiaries, and by American firms borrowing directly from overseas banks or capital markets. The Federal Reserve Board acknowledged this possibility in its March 14, 1980, tightening of monetary policy, indicating that it would scrutinize carefully the overseas borrowing practices of American firms.

The picture for domestic policy has been further clouded by an increase in the number of foreign-based multinational firms that now have American subsidiaries. Plans for research and development, capital investment, or the shifting of facilities from one region to another will now be partially influenced by decisions made in foreign board rooms or, to some extent, in foreign capitals.

U.S. Tax Policy

The debate continues over whether or not the United States should attempt to influence the direction and the nature of international capital flows. Domestic and foreign tax policy lie at the center of the controversy. Under current American law, the overseas earnings of the subsidiaries of American-based multinationals are not taxed until they are actually repatriated to the parent company in the United States. In addition, when the parent company does repatriate the overseas profits, any taxes paid to the foreign government can be credited against Federal tax liability.

Does this make foreign investment more attractive to American firms? And, if so, how much? The short answers to both questions are almost surely that taxes provide some, but not very great, inducements to overseas investment. Other factors, such as market access and various aspects of cost of production, are almost certainly more important. The delay or deferral in paying taxes is something that domestic firms do not enjoy, but the deferral does not apply to foreign taxes. If a foreign country imposes a tax burden similar to that of the United States, the deferral would have little impact on investment flows. The corporate tax rates in most advanced industrial countries are roughly comparable to those in the United States, although the effective (what the firm actually pays) rates appear to be somewhat lower. Possibly favoring foreign investment is the increasing use of the Value Added Tax (VAT) abroad, particularly as administered in the European community. This operates in a manner to maximize the competitive power of manufacturing in VAT countries for export to non-VAT countries, such as the United States. *

---

* For an interesting detailed analysis of the possible triple advantages of using VAT, see Chapter 5, "The International Economic Posture of the United States," by Oscar Gass, printed in Volume IX, SSEC.

A number of critics of the American-based multinational firm would like to put the foreign subsidiary on exactly the same footing as a domestic subsidiary. There is no deferral for income earned by a domestic subsidiary and, in addition, taxes paid to a state government can only be treated as a deduction rather than used dollar for dollar to reduce Federal tax liability. Eliminating the deferral provision would make some difference to the American-based multinational, but disallowing foreign taxes as a credit would be a severe financial penalty. The crucial tax difference is that foreign corporate taxes are a great deal higher than those imposed by individual states. An important general consideration is that tightening U.S. taxation of foreign earnings could reduce overall corporate profits which are a major source of investment funds at home.

Given differences in tax laws around the world, it is hard to devise a completely evenhanded treatment for multinational firms. Should the overseas subsidiaries of American firms be put on an equal footing with domestic firms in the United States, or with domestic firms in the foreign country or with the subsidiaries of, say, French-based multinationals operating in the same foreign country? In practice, the U.S. has chosen something of an amalgam of the first two approaches. When it comes to the taxation of overseas income, most industrial countries are more generous than the United States -- imposing virtually no taxes on the overseas earnings of their corporations. This is not to say that corporate capital is more mobile in foreign countries. Most of them impose a variety of restraints on foreign direct investments through formal capital controls, government industrial policy, or other regulations.

The question of tax policy is further complicated by the fact that the United States limits some tax incentives to domestic firms. The Domestic International Sales Corporation (DISC) provision allows domestic firms to defer taxes on a portion of their earnings from export sales. In part, the law was specifically enacted to offset the potential incentive to invest overseas created by the deferral of taxes on overseas income. In addition, the investment tax credit, an important investment incentive for many firms, applies only to domestic, not foreign, investment.

There are also some inducements for foreign direct investment. Although the U.S. Government has consistently sought to restrict the use of investment-distorting incentives, a number of individual states have actively sought foreign direct investment with the lure of tax relief and other inducements.

The question of taxation and its impact on international capital flows is likely to reappear in the 1980's as the United States, Europe, and, to some extent, Japan all seek to restructure and strengthen their domestic industries. The stability of the American Government, the breadth and basic vitality of the American market, and the recent decline in the international value of the dollar have all made America a more attractive place to invest. The movement to stimulate additional investment in new plant and equipment could well attract considerable foreign capital and might trigger some type of countervailing incentives overseas, creating yet another challenge for American policy.

Investment Incentives

The proliferation of multinational corporations is just one of many factors that has drawn the American economy closer to economic decisions made elsewhere around the globe. Worldwide economic ties have made government intervention considerably more complicated. Incentives for investment could attract more foreign-based firms, and the added foreign direct investment could provide stimulus to American growth and make the domestic economy even more competitive. At the same time, it could begin to erode the large net surplus in the U.S. services account that stems largely from income from U.S. investments overseas.

The increase in the number of joint ventures and the growing system of producing parts of a product in several countries has further complicated the use of import restraints. An import restraint used to aid one industry could disrupt a complex arrangement made by another domestic industry, or it could invite additional direct investment with unforeseen consequences for domestic industry.

Perhaps the most important of all the changes in the foreign investment scene is the change in attitude in the United States since the early postwar period. America then looked out from a rich, secure bastion at a world either stuck in secular poverty or in need of reconstruction. The United States had the largest share of the world's goods, the greatest store of domestic capital, and the biggest monetary reserves. In the wake of the Marshall Plan, PL-480, and the U.S. encouragement of the formation of the European Community, there were many economic and political incentives to invest abroad. Therefore, now there is a case for rethinking U.S. investment priorities.

There can be little doubt that restructuring the entire U.S. tax system will be a priority item in the next decade. As part of that exercise, this country will have to re-examine domestic versus international incentives that are built into the U.S. tax system.

U.S. domestic investment has consistently been well behind the domestic investment ratio of most other advanced OECD countries. This domestic investment lag came even as the United States experienced a unique and substantial increase in the labor force, which will continue at least for the remainder of this century. Sound policy now dictates examination of the potential dangers of operating a capital-shy domestic economy, as pointed out in several SSEC papers. * Obviously, more American capital resources should be devoted to domestic use, especially if the United States is both to reverse its productivity slump and shore up the supply side of the economy. Thus, when new or continuing tax incentives are studied for the whole of the U.S. capital market, policymakers must consider the extent to which existing incentives encourage the flow of American funds abroad. It may now be necessary to focus on an array of incentives for much needed industrial and energy revitalization at home. At the very least, tax disincentives on domestic savings and investment, which have been compounded by inflation, and regulatory barriers to domestic investment should be given a critical examination.

---

* See particularly Volume 4, Stagflation; Volume 8, Social Security and Pensions; and Volume 10, Productivity.

VII
POLICY IMPLICATIONS

Trade

U.S. policy should be directed toward improving the international competitive position of the U.S. economy through cooperative efforts of U.S. business, labor, and government, recognizing that, in the long run, lagging domestic productivity adversely affects the U.S. balance of trade and payments.

The United States should continue its open trade policy of fewer and lower trade barriers and encourage the reduction of tariffs and nontariff barriers on the part of its trading partners.

The problem of exchange rates and their effect on trade should be considered in formulating trade policy.

U.S. exports should be encouraged. Congress should review export promotion programs and incentives directed toward small- and medium-size firms as well as large industries, and should review Export-Import Bank financing arrangements to help make U.S. export financing facilities more competitive with those of its trading partners.

The role of the U.S. Trade Representative (USTR) should be further strengthened and enlarged.

The United States should continue its "fair trade" policy of acting firmly against imports that are subsidized or dumped, when these imports can be shown to injure domestic producers.

Adjustment assistance programs to workers, firms, and communities adversely affected by imports should be re-evaluated with a view to making them more effective. Greater emphasis should be placed on redirecting resources of depressed industries into new and more profitable directions and on retraining and possibly relocating displaced employees for jobs in growth sectors of the economy.

The United States should not depend on Communist sources for a substantial portion of its supply of any product, though exceptions may have to be made in the case of a few raw materials. Special remedies against injury to domestic producers caused by imports from those countries, where the price may be set independently of the cost of production, should be implemented as provided by law.

Although it will be a difficult and long-term task, the United States should continue to push for the dismantling of agricultural trade barriers, particularly in the developed countries.

Oil and Energy

Public policy should be directed toward reducing U.S. dependence on oil imports, particularly from OPEC members, and, to the extent imports will remain necessary, encouraging access to alternate sources of oil.

The United States should also encourage oil and natural gas exploration in non-OPEC developing countries through technical assistance and the equity participation of U.S. enterprise.

Developing Countries

The United States should maintain its bilateral and multilateral development assistance specifically to combat absolute poverty in the low-income countries and among the poorest groups in the middle-income countries for moral and humanitarian reasons in addition to long-run economic and political interests.

U.S. trade policies should continue to maintain and expand access to U.S. markets for third world countries -- critically important in the development of some countries -- but with increasing attention to resulting community or market disruption.

The United States should enter into commodity agreements with the objective of achieving price stabilization and should encourage a review of various mechanisms to neutralize upward pressures on prices.

International Finance

A pragmatic foreign exchange rate policy will demand greater oversight by U.S. monetary authorities under the present system of floating than under any system of fixed or partially fixed rates. The evidence suggests that widely fluctuating exchange rates have an inflationary effect on the domestic economy; therefore, exchange rate stability is as much a matter of domestic as of international policy.

No rigid position on the issue of Federal Reserve intervention should be taken because the sometimes volatile nature of foreign exchange markets does not lend itself to firm rules about policy or rate behavior.

There is now an extra burden on domestic policymakers to reduce price inflation even at the expense of the more immediate attainment of some other policy goals. A course of action, utilizing fiscal and monetary policies, for improving the price picture over the long-run has been outlined in other studies in the SSEC.

The United States and the rest of the world must depend on an imperfect system for some years to come while adjusting to the fact that the freedom of domestic economic policies of every country is constrained under the present system of flexible exchange rates, possibly even more than previously.

Since private banks are not in the favorable position they enjoyed earlier in the 1970's, the recycling process must increasingly be accomplished through international institutions and governments, but in a noninflationary fashion. In the process, the country risk associated with this borrowing should be shifted as much as possible directly to the OPEC surplus countries or to multilateral institutions. The United States should continue to play a leadership role in this area.

U.S. Investment Abroad

In the decade ahead, more American capital resources should be devoted to domestic investment, especially if the United States is to reverse its productivity slump and shore up the supply side of the economy. When tax incentives for the whole area of capital formation are studied, policymakers must consider the extent to which existing incentives encourage the flow of American funds abroad and existing disincentives discourage the use of funds at home. It may now be necessary to focus on an array of incentives for much needed industrial and energy revitalization within the United States.

AUTHORS OF SELECTIONS

RICHARD D. BARTEL, *SSEC*
BERNARD BLANKENHEIMER, *Economic Consulting Services, Inc.*
WILLIAM H. BRANSON, *Princeton University*
WILLIAM R. CLINE, *The Brookings Institution*
ROBERT B. COHEN, *Columbia University*
OSCAR GASS, *Consulting Economist*
ROBERT G. HAWKINS, *New York University*
ROBERT Z. LAWRENCE *The Brookings Institution*
STANLEY NEHMER, *Economic Consulting Services, Inc.*
CHARLES PEARSON, *The Johns Hopkins University*
THOMAS A. PUGEL, *New York University*
WILLIAM V. RAPP, *Morgan Guaranty Trust Company*
JAMES RIEDEL, *The Johns Hopkins University*
ROBERT L. SAMMONS, *Consulting Economist*
H. WILLIAM TANAKA, *Tanaka, Walders and Ritger Law Firm*
RAYMOND VERNON, *Harvard University*
INGO WALTER, *New York University*
THOMAS D. WILLETT, *Claremont Graduate School and Claremont Men's College*
THOMAS WOLFE, *Economic Consulting Services, Inc.*

Contributors of Peer Reviews

(Contributing authors who also reviewed papers in this section are not listed as peer reviewers)

DEBORAH ALLEN, *Claremont Economics Institute*
ROBERT E. BALDWIN, *World Bank*
PAUL A. BELFORD, *Overseas Investment Corporation*
PETER CLARK, *Federal Reserve System*
ANDREW D. CROCKETT, *International Monetary Fund*
JANE D'ARISTA, *Congressional Budget Office*
DONALD E. DE KIEFFER, *Esq., Collier, Shannon, Rill, Edwards & Scott*
JOEL B. DIRLAM, *University of Rhode Island*
JACOB S. DREYER, *Department of the Treasury*
GEZA FEKETEKUTY, *Office of United States Trade Representative*
LARRY A. FOX, *National Association of Manufacturers*
MORRIS GOLDSTEIN, *International Monetary Fund*
PETER HOOPER, *Federal Reserve System*
ELIZABETH R. JAGER, *AFL-CIO*
JOHN KARLIK, *Department of the Treasury*
ANTHONY LANYI, *International Monetary Fund*
HARRY K. LENNON, *International Representative, International Movement, ATD, Fourth World*
BARBARA LLOYD, *Department of the Interior*
H. ROBERT MARSCHALK, *Richardson-Merrell, Inc.*
R.H. MILLS, JR.,*Federal Reserve System*
J. CARTER MURPHY, *Southern Methodist University*
SAMUEL PIZER, *Federal Reserve System*
ALFRED REIFMAN, *Congressional Research Service*
ARNOLD W. SAMETZ, *New York University*
RICHARD H. SINES, *The George Washington University*
ROBERT M. STERN, *University of Michigan*
SIMON D. STRAUSS, *ASARCO, Inc.*
MELVILLE ULMER, *University of Maryland*
STEVEN WEISS, *Office of the Comptroller of the Currency*

Author's Biographical Data

Richard D. Bartel, *Executive Editor of Challenge* magazine, formerly served as an economist with the Joint Economic Committee's Special Study on Economic Change and with the Federal Reserve Bank of New York. His areas of specialization include international economics, monetary economics and microeconomic theory.

Bernard Blankenheimer is Vice President of Economic Consulting Services, Inc. He served as Director of the Commerce Department's Office of Import Programs, and for eight years was Director of the program's Africa Division. In addition, he served as a commercial attache in the U.S. Foreign Service.

William H. Branson is Professor of Economics and International Affairs at Princeton University and Director of Research in International Economics at the National Bureau of Economic Research. He has served as an associate editor for a number of international economics journals and as a consultant to the Federal Reserve Board, the U.S. Treasury Department, the Council of Economic Advisers and the Ford Foundation.

William R. Cline is a Senior Fellow at The Brookings Institution Foreign Policy Studies Program and has served as a consultant to private and government agencies including the Ford Foundation, the Agency for International Development, the International Labor Office and the Overseas Development Council. He also served as Deputy Director for Development and Trade Research in the Office of the Assistant Secretary for International Affairs of the U.S. Treasury Department. He is an expert in the economies of developing countries.

Robert B. Cohen is a Senior Research Associate, Conservation of Human Resources Project, and Adjunct Assistant Professor, Division of Urban Planning, at Columbia University and has served as a staff member and consultant to the United Nations Centre on Transnational Corporations. His research interests include the impacts of structural change in the international economy on domestic activities. He has published extensively on the role of international banking and multinational corporations in the transformation of world capital markets.

Oscar Gass is a Consulting Economist in Washington, D.C., and a recognized expert in international development planning and in energy economics. His clients have included the World Bank, the Embassy of Japan in Washington, and the governments of Israel and Indonesia. He has published extensively on international issues, especially affecting the Middle East, Europe and the Far East, as well as domestic U.S. economics and politics.

Robert G. Hawkins is Professor and Chairman of the International Business Department of the Graduate School of Business Administration, New York University. He is also Director of that university's project, "The Multinational Firm in the U.S. and World Economy." In addition to serving as consultant to a number of public and private agencies including the United States Information Agency, the Organization for Economic Cooperation and Development and the Council on International Economic Policy, Mr. Hawkins is Associate Editor of the Journal of International Business Studies.

Robert Z. Lawrence is a Research Associate at The Brookings Institution, currently researching the role of primary commodities in inflation. He also serves as Assistant Editor of the Brookings Papers on Economic Activity.

Stanley Nehmer is President of Economic Consulting Services, Inc., and former Deputy Assistant Secretary of the U.S. Department of Commerce where he was in charge of government programs affecting key U.S. industries. Mr. Nehmer served in the Department of State in various capacities, including Director of the Office of International Resources, and was also a senior economist at the International Bank for Reconstruction and Development.

Charles S. Pearson is Associate Professor of International Economics at The Johns Hopkins School of Advanced International Studies. He also serves as a staff member and consultant to the Commission on International Trade and Investment and as a member of the Atlantic Council Working Group on U.S. Policy Toward Developing International Countries. Mr. Pearson has done extensive research in international trade among developing countries, and has published widely on developing economies and on international environmental issues.

Thomas A. Pugel is Assistant Professor of Economics and International Business at the New York University Graduate School of Business Administration. In addition he is a contract researcher for the North American Export Grain Association, analyzing aspects of the U.S. grain export industry. He has served as a consultant to the U.S. Department of Labor as well as to private companies in the areas of international economics and finance.

William V. Rapp, Vice President, Morgan Guaranty Trust Company of New York, is a recognized expert on the Japanese economy. He is presently the Toyota Visiting Professor of International Business at Columbia University and a Visiting Lecturer at New York University. He was previously a consultant for the Boston Consulting Group in Boston and Tokyo.

James C. Riedel serves as Assistant Professor of International Economics at The Johns Hopkins University School of Advanced International Studies. He is consultant to the International Trade Research Committee, and the Committee for Economic Development, and has previously provided consulting services to a variety of national and international organizations, including the United Nations and the World Bank. His published work deals with questions of industrial development in developing countries and international trade and monetary issues.

Robert L. Sammons served as Associate Director of the Federal Reserve Board's Division of International Finance. He also headed the Monetary Division of the Department of Economics and Statistics of the Organization for Economic Cooperation and Development (OECD) in Paris. Mr. Sammons has represented the United States in numerous delegations to OECD and United Nations economic conferences. He is a specialist in central banking and monetary policy, as well as national income accounting, especially balance of payments.

H. William Tanaka is a member of the law firm of Tanaka, Walders & Ritger in Washington, D.C., representing American and Japanese firms involved in bilateral trade. He is a frequent visitor to Japan, an expert in Japanese business and government, and a former President of the Japan-America Society of Washington.

Raymond Vernon is Herbert F. Johnson Professor of International Business Management and Clarence Dillion Professor of International Affairs at Harvard University. He is an authority on multinational corporations and has been a consultant to U.S. Government agencies as well as to various United Nations agencies. He is the author of numerous books and articles on international economics and on multinational corporations.

Ingo Walter is Professor of Economics and Finance and Associate Dean of the Graduate School of Business Administration, New York University. He has published extensively in the areas of international economics and environmental economics.

Thomas D. Willett is Horton Professor of Economics at Claremont Graduate School and Claremont Men's College and is Adjunct Scholar at the American Enterprise Institute for Public Policy Research. He served in the Treasury Department as Director of Research for International Economic Affairs and Director of International Monetary Research as well as Deputy Assistant Secretary for International Affairs. He has published widely on international monetary issues, exchange rates and the U.S. balance of payments.

Thomas Wolfe, Associate Director of Economic Consulting Services, Inc., is a specialist in government finance, international trade and the balance of payments and on gold and silver trading in the world market. He has served in numerous positions in the U.S. Treasury Department including Deputy to the Assistant Secretary for Fiscal Affairs, and Director of the Office of Gold and Silver Operations.

Contents of Volume

The following outline contains a list of titles and authors of papers which will appear in the final printed volume of The International Economy area.

Section 1 -- The International Economic Position of the United States

1. "The International Economic Posture of the United States" (Oscar Gass, Consulting Economist)
2. "Dynamic Transformation of the World Economy: The U.S. Policy Response" (Richard D. Bartel, *Challenge* magazine)
3. "The Changing Position of U.S. Industries in the Global Pattern of Industrial Production" (Thomas A. Pugel, New York University, Graduate School of Business Administration)
4. "Sustaining American Growth in a Competitive World Economy: The Challenge of the 1980's" (Thomas Wolfe, Economic Consulting Services, Inc.)

Section 2 -- International Trade

1. "Long-Term Change in the Foreign Trade Policy of the United States" (William R. Cline, The Brookings Institution)
2. "The Symptoms of Declining United States International Competitiveness" (James Riedel, The Johns Hopkins University)
3. "The United States Current Account: Trends and Prospects" (Robert Z. Lawrence, The Brookings Institution)
4. "The Trade Act of 1974 as a Vehicle for Adjustment" (Stanley Nehmer, Economic Consulting Services, Inc.)
5. "The United States and Japan: Competition in World Markets: Policy Alternatives for the United States" (William V. Rapp, Morgan Guaranty Trust Company)
6. "U.S. Trade Considerations" (H. William Tanaka, Tanaka, Walders and Ritger)

Section 3 -- Developing Countries

1. "The North-South Dialog and Its Bearing on U.S. Commodity Policy" (Bernard Blankenheimer, Economic Consulting Services, Inc.)
2. "Adjusting to Imports of Manufactures from Developing Countries" (Charles Pearson, School of Advanced International Studies, Johns Hopkins University)

Section 4 -- International Finance

1. "Monetary and Fiscal Policy with Adjustable Exchange Rates" (William H. Branson, Princeton University)
2. "Structural Change in International Banking and Its Implications for the U.S. Economy" (Robert B. Cohen, Columbia University)
3. "International Capital Flows: Recent Experience and Issues for the Future" (Robert L. Sammons, Economic Consultant)
4. "International Liquidity Issues and the Evolution of the International Monetary System" (Thomas D. Willett, Clarement Graduate School and Claremont Men's College)

Section 5 -- U.S. Investment Abroad

1. "Multinational Corporations: Current Trends and Future Prospects" (Robert G. Hawkins and Ingo Walter, Graduate School of Business Administration, New York University)
2. "The Multinationalization of U.S. Business: Some Basic Policy Implications" (Raymond Vernon, Harvard Graduate School of Business)

Index Narrative

The 18 papers in the International Area are arranged in five sections: The International Economic Position of the United States, International Trade, Relations with Developing Countries, International Finance, and U.S. Investment Abroad.

Section 1 — International Economic Position of the United States:

Oscar Gass provides a wide-ranging review and analysis of "The International Economic Posture of the United States." He finds that while the United States still holds a foremost position in the world economy, its comparative productivity gain has not only slowed but retrogressed in recent years. He examines the worldwide problems of energy, developing countries, trade, investment, money and banking, and defines what the U.S. position and role should be in each of these areas.

Richard D. Bartel, in an essay titled "Structural Change in the World Economy and the U.S. Response," examines the fundamental economic changes which have transformed the global economy in the 1970's, especially the eight-fold jump in U.S. oil import prices and the shift in U.S. comparative advantage. The study suggests new strategies for long-term U.S. monetary, industrial and commercial policies.

Another study relates how the international position of U.S. manufacturing industries is changing, reflecting a shift in U.S. comparative advantage, especially in relation to Japan and the developing countries. **Thomas A. Pugel**, in "The Changing Position of U.S. Industries in the Global Pattern of Industrial Production," compares the growth rates of output for 12 manufacturing industries in the United States, Japan and five areas of the world in the 1960's and early 1970's.

In "Sustaining American Growth in a Competitive World Economy," **Thomas W. Wolfe** notes the intense competition for world resources and trade which has developed in the post-World War II period. In this changed environment, U.S. policy objectives should be to increase productivity to make the U.S. fully competitive, and to develop an efficient institutional structure for international trade with closer cooperation between government and industry.

Section 2 — International Trade:

William R. Cline, in "Long-Term Changes in the Foreign Trade Policy of the United States," finds that it is difficult to be optimistic about U.S. trade performance unless U.S. productivity can be increased. A less inflationary environment is the key to higher investment and productivity growth. Cline recommends a revitalized program for the Export-Import Bank to enhance U.S. competitiveness. He examines the history and impact of trade negotiations in the post-War era and concludes that a strengthened GATT will be an important vehicle for dealing with trade issues in the future.

In "The Symptoms of Declining United States International Competitiveness," **James Riedel** argues that symptoms of declining competitiveness are attributable far more to the catching up of other countries than to the economic decline of the United States. Riedel concludes that since the reconstruction of Europe and Japan and the narrowing of the gap between rich and poor countries had been a cornerstone of U.S. post-War foreign economic policy, the declining share of U.S. exports is perhaps more an indication of U.S. success than failure. The trade balance has also been subject to downward secular pressure as a result of more rapid industrial growth abroad than in the United States, although recent deficits are primarily the result of rising oil prices and adverse cyclical factors.

Robert Z. Lawrence, in "The United States Current Account: Trends and Prospects," examines the components of the current account -- the goods component, with specific analyses of the food, fuel, and manufactured goods trade; and the services account. Lawrence finds that the United States will continue to have a substantial trade deficit into the 1980's, but that the services surplus will constrain its size. He writes that fiscal policy should be used to achieve a maximum amount of private capital formation along with a reduction in current public consumption. Lawrence recommends a devaluation of the dollar to provide incentives for production of tradeable goods and to make the U.S. a more attractive place to invest.

Stanley Nehmer in "The Trade Act of 1974 as a Vehicle for Adjustment" evaluates the provisions of the Act dealing with import relief -- orderly marketing agreements (OMAs), escape clause, and other remedies. Strong effective legislation is needed to ease the burden on American industries and workers injured by imports and to facilitate the economic adjustments essential to strengthening the position of the United States in an increasingly competitive world. The paper suggests a number of specific ideas for providing speedier and more effective relief.

In "The United States and Japan: Competition in World Markets, Policy Alternatives for the United States," **William V. Rapp** discusses the theoretical basis for Japan's economic success, and the competitive problems of the United States. He outlines an alternative framework for formulating U.S. economic policy analogous to Japan's based on growth, long-term objectives, promotion of savings and investment, and cooperation between government, business and labor.

William H. Tanaka, in a statement before the Joint Economic Committee -- "U.S. Trade Considerations" -- deals with U.S. export performance and the domestic factors which influence it. He finds that U.S. exports are inhibited by policy and legal constraints and that the United States lacks a national export policy. As a percentage of GNP, U.S. export performance lags behind that of other developed counties and the resulting trade deficits have been a major factor in undermining the value of the dollar.

Section 3 — Developing Countries:

"The North-South Dialogue and its Bearing on Commodity Policy" by **Bernald Blankenheimer** studies U.S. policy with regard to commodity price stabilization and income transfers to Third World countries. The paper concludes that, although the United States has an interest in Third World raw materials, commodity agreements do not, in fact, assure wider access to supply. The paper notes that Third World interest in commodity agreements is generally to raise prices with the aim of increasing total export revenues rather than stabilizing prices and supply.

Charles Pearson, in "Adjusting to Imports of Manufactures by Developing Countries," analyzes the rapid growth of manufactured exports from developing countries. their recent product diversification and the increasing number of exporting countries. He explores the types of adjustments within the United States which are necessary and desirable to deal with this problem, preferring positive adjustment policies rather than trade restrictions which can be costly and ineffective.

Section 4 — International Finance:

William H. Branson, in "Monetary and Fiscal Policy with Adjustable Exchange Rates," examines the reasons why traditional assumptions about the exchange rate have not held, and discusses implications for exchange rate and balance of payments adjustment as well as for monetary and fiscal policy. Branson concludes that expansionary demand policy in any one major country will generate a current account deficit, devaluation and inflation in that country and will be unsustainable for long. Active demand policy for recovery must be coordinated across countries to avoid this type of imbalance, he says.

The Eurodollar market and its impact on the world economy is the subject of a paper by **Robert B. Cohen**. "Structural Change in International Banking and Its Implications for the U.S. Economy" analyzes the world steel industry as a case study of the impact of the international banking system on industrial growth. It also assesses the effectiveness of U.S. government policies to resolve the potential conflict between bank lending practices and industrial development.

Robert L. Sammons, in "International Debt: Its Growth and Significance," studies the sharp rise in outstanding international obligations since 1974. The major factor in this development is the surplus of the oil-producing countries as a group, augmented by those of Switzerland, Japan and Germany. The paper finds (1) that the ability to obtain credit abroad has enabled many countries to avoid, or postpone, the negative effect on their balance of payments and their real incomes imposed by the oil price hike; and (2) that in the longer run, the buy-now pay-later policy involved in financing the deficits by borrowing abroad will effectively reduce the terms-of-trade impact of the oil price hike -- another instance of debtors profiting from inflation.

Thomas D. Willett notes the controversy surrounding many aspects of the international monetary system in his paper "International Liquidity Issues and the Evolution of the International Monetary System." The study provides an analytic history of major international liquidity concepts and issues. Willett finds that the current decentralized system of international liquidity creation has more built-in stabilizing mechanisms than generally recognized. Willett also considers some major proposals for dealing with international liquidity problems and expresses doubts about the benefits of greater control of international liquidity.

Section 5 — U.S. Investment Abroad:

"Multinational Corporations: Current Trends and Future Prospects," by **Robert G. Hawkins** and **Ingo Walter**, surveys current and prospective trends in MNC activities and the economic and political environment in which MNCs operate. The paper concludes that liberal policies toward inward and outward foreign direct investment have served the United States well in the past and will continue to do so. The United States should resist policies that hamper the competitiveness of multinational corporations through the international extension of domestic social policies. Rather, officials should press for an internationally accepted set of rules for foreign activities of MNCs similar to GATT in international trade.

Raymond Vernon, in "The Multinationalization of U.S. Business: Some Basic Policy Implications" notes that multinational firms account for about two-thirds of the goods and services produced in the U.S. economy and the prospect is that they will continue to account for a large and increasing share of the U.S. economy and those of other countries as well. Vernon analyzes the problems of multinationalization for the United States -- taxation, antitrust matters, jurisdictional questions and security controls -- and suggests new U.S. policies which would subordinate domestic laws to international agreements and international institutions.

Volumes of the Special Study on Economic Change

- Human Resources and Demographics
- Energy and Materials
- Research and Innovation
- Stagflation
- Government Regulation
- Federal Finance
- State and Local Government
- Social Security and Pensions
- The International Economy
- Productivity

The International section of the Special Study on Economic Change, Joint Economic Committee, is one of 10 sections of the SSEC. Orders for this study may be placed by contacting:

Joint Economic Committee
Room G-133
Dirksen Senate Office Building
Washington, D.C. 20510
Telephone: (202) 224-5321

Productivity:

The Foundation of Growth

Joint Economic Committee
Special Study on Economic Change

A staff study
November 1980

The Joint Economic Committee's Special Study on Economic Change (SSEC) was inaugurated under the leadership of then Chairman Richard Bolling (D.-Mo.) and Vice Chairman Hubert H. Humphrey (D.-Minn.), together with Senator Jacob K. Javits (R.-N.Y.), ranking Minority Member.

The study progressed through Mr. Bolling's chairmanship and into the leadership of Senator Lloyd Bentsen (D.-Tex.), chairman; and Congressman Clarence J. Brown (R.-Oh.), ranking Minority Member. The goal of the SSEC is to chart the major changes in the economy and to analyze their implications for policymakers.

Volumes of the Special Study on Economic Change

Human Resources and Demographics
Energy and Materials
Research and Innovation
Stagflation
Government Regulation
Federal Finance
State and Local Government
Social Security and Pensions
The International Economy
Productivity

JOINT ECONOMIC COMMITTEE

LLOYD BENTSEN, *Texas, Chairman*
RICHARD BOLLING, *Missouri, Vice Chairman*

SENATE

WILLIAM PROXMIRE, *Wisconsin*
ABRAHAM RIBICOFF, *Connecticut*
EDWARD M. KENNEDY, *Massachusetts*
GEORGE McGOVERN, *South Dakota*
PAUL S. SARBANES, *Maryland*
JACOB K. JAVITS, *New York*
WILLIAM V. ROTH, JR., *Delaware*
JAMES A. McCLURE, *Idaho*
ROGER W. JEPSEN, *Iowa*

HOUSE OF REPRESENTATIVES

HENRY S. REUSS, *Wisconsin*
WILLIAM S. MOORHEAD, *Pennsylvania*
LEE H. HAMILTON, *Indiana*
GILLIS W. LONG, *Louisiana*
PARREN J. MITCHELL, *Maryland*
CLARENCE J. BROWN, *Ohio*
MARGARET M. HECKLER, *Massachusetts*
JOHN H. ROUSSELOT, *California*
CHALMERS S. WYLIE, *Ohio*

JOHN M. ALBERTINE, *Executive Director*
LOUIS C. KRAUTHOFF II, *Assistant Director-Director, SSEC*
RICHARD F. KAUFMAN, *Assistant Director-General Counsel*
CHARLES H. BRADFORD, *Minority Counsel*

Table of Contents

CHAIRMAN'S INTRODUCTION .... **i**
Senator Lloyd Bentsen
RANKING MINORITY MEMBER'S INTRODUCTION .... **iv**
Rep. Clarence J. Brown
I. **The Productivity Problem in Perspective** **1**
II. **Why Productivity Has Declined** **5**
III. **The Measurement Problem** **15**
IV. **Productivity at the Sectoral and Industry Levels** . **17**
V. **The Decline of Net Investment** **20**
VI. **Employment and Labor Force Growth** **23**
VII. **The Nature of the Investment Problem** **25**
VIII. **The Role of Tax and Energy Policies** **27**
IX. **The Role of Human Capital** **31**
X. **Policy Recommendations** **35**

LOUIS C. KRAUTHOFF II, *Director*
GEORGE D. KRUMBHAAR, JR., *General Counsel*
BILL R. MADDOX, *Editor*

PRODUCTIVITY:

The Foundation of Growth

Prepared under the direction of:

TIMOTHY P. ROTH
Senior Economist, SSEC

With the assistance of:

L. DOUGLAS LEE
Senior Economist,
Data Resources, Inc.

CHAIRMAN'S INTRODUCTION

Senator Lloyd Bentsen

Chairman, Joint Economic Committee

Rising productivity is a sure sign of economic health. Rising productivity means an increased standard of living for the average American. But America today neither enjoys the economic health nor the increasing standard of living experienced in other years. The prime cause is the erosion of productivity.

I am convinced, as I have been for several years, that worker productivity has slowed down chiefly because the United States is investing less and less in productive machinery.

I have long stressed the overriding importance of increased productivity as the best means of assuring a strong, expanding economy. I have emphasized the critical nature of productivity as the link to our restoring America's competitive edge in world markets. But without greater capital formation -- the devotion of resources to better factories, more efficient offices and stores, and higher skills -- there will not be greater productivity.

An example I have used before remains appropriate: If you have two willing, able workers, and you equip one with a handsaw and the other with a power saw, who is going to produce the most units of labor? Whose productivity will be the highest?

To me, the connection between capital formation and productivity is not the complex issue some would make of it. Capital formation and productivity fit together like a hand and a glove, as the following statistics from this staff study confirm:

Since World War II, America's real output -- its gross national product (GNP) -- has grown 3.5 percent annually. Almost half of this growth is directly attributable to placement of *new* plant and equipment. When coupled with growth in productivity caused by the *replacement* of worn out and obsolete tools, and improved worker skills, 77 percent of the nation's growth is accounted for. The message is, if investment declines, so will productivity and therefore growth.

America has grown because it was able to expand and make more efficient the employment facilities for growing numbers of people who wanted to hold good jobs and improve their lot in life with incomes that grew much faster than prices.

However, as investment has declined, so has the growth in standards of living. In the 1960's, for example, real per capita income grew 2.6 percent a year. Income growth slipped to 2.4 percent in the 1970's which, on the surface, might not appear to be so bad. But in the 1960's, the Nation's income was split among a *fast* growing population and *still* managed to increase significantly. In the 1970's, the Nation's income was divided among a *slower* growing population, which should have meant, with a stronger economy, that per capita incomes should have grown faster than in the 1960's.

This slower growth in the past decade has established a trend which the staff study addresses: If America's productivity performance is as poor in the 1980's as in the 1970's, real per capita income growth will be cut in half, falling to 1.2 percent. This would mean that, by 1990, real per capita income would reach about $7,140. If, however, the Nation follows an economic course set forth in this staff study, 1990 real per capita income could reach $8,150 in current dollars, fully 26 percent higher than its 1979 level of $6,476.

I believe we can do even better than that by making a strong commitment to necessary investment in equipment and skills, by appropriate tax, energy, regulatory and other policies which lift horizons and expand the supply of goods and services.

Specific proposals made in this study include the following:

- A faster tax write-off for plant and equipment, approaching current replacement costs.
- Reduction of tax rates on dividends and interest income to encourage savings, which can be used for investment.
- The establishment of a regulatory budget and other measures, which would set limits on compliance costs of regulation

and free more resources for private enterprise to increase productivity.

- A series of energy measures to encourage domestic production, conservation, and more efficient, productive use of energy.
- More incentives for research and development, and for the conversion of new technology into the workplace.

Other recommendations listed in the study can help to turn the productivity course around and to improve the Nation's productive potential.

Although our productivity record has fallen, our vision remains as lofty, as clear and as vast as in our best times. Over the years ahead, productivity will be used as the measure to determine if this vision is ultimately realized.

Ranking Minority Member's Introduction

CONGRESSMAN CLARENCE J. BROWN

The importance of productivity to the American economy is finally being recognized by policymakers. The abysmal productivity performance of this country over the past few years has abetted inflation and unemployment increases and is the major cause of the decline in real after-tax wages for our workers. It is this damage to wages of the average American that is the most serious consequence of our slumping productivity.

When productivity grows rapidly, sizable increases in real income are possible. For many years, increases in wages were equal to inflation increases plus productivity gains. When productivity slumps or fails to grow, wage increases closely approximate inflation increases. The result is stagnant real income growth, such as we have had for the past decade. Rapidly increasing productivity was the secret in the phenomenal rise in America's standard of living in the 1950's and 1960's. From 1949 to 1968, productivity grew 2.6 percent per year, on average.

On the other hand, when employee compensation rises but the output per employee does not, the labor cost for each product is higher. So the factory charges more for each item. The consumer readily recognizes that as inflation. Wages are higher and prices are higher, but there is no increase in the standard of living. Between 1968 and 1978, productivity gains averaged only 1.6 percent per year. And in 1979 and for the first half of 1980, productivity actually fell.

The two major factors on which productivity depends are: (1) increases in the amount of capital (plant and equipment) per worker, and (2) technological innovation that brings more output per worker -- in short, more and better equipment.

Government statistics confirm the relationship. From 1949 to 1968, the capital-labor ratio grew at an average annual rate of about 3 percent, closely paralleling the productivity growth rate during that period of economic prosperity and rising opportunity. In the past decade of high inflation and low growth in real personal income, the capital-labor ratio increased only 1 percent per year, again approximating the productivity growth rate.

These facts now are widely know by economists and policymakers inside and outside our Government. Indeed, hand-wringing over our lagging productivity growth is now one of official

Washington's favorite pastimes. Yet, a major policy initiative to reserve this trend has not passed the Congress.

Tinkering with policies that might encourage more research and development will not help if the new technologies can't be converted into new processes and machines. We must turn our productivity trends around through large-scale investment in new business plant and equipment. The alternative is a future of stagnant living standards, rising unemployment and raging inflation.

Business investment comes from personal savings, from funds set aside under depreciation allowances and from business profits. In recent years, these sources of investment have been increasingly whittled away.

First, Government borrows much of the saving to finance the huge Federal Government budget deficits. The accumulated Federal debt is more than $800 billion.

Second, most investment goes to replace worn-out equipment, not to buy additional equipment. The depreciation set-aside is supposed to finance that, but actual depreciation is larger than allowable depreciation because inflation raises replacement costs. Business must dip into profits to supplement the depreciation allowance just to maintain its productive capacity -- just to stand still. Thus, corporate profits are overstated, and taxes are paid on income which is not really profit. The result: profits have dropped to 80 percent of their level of a decade ago, measured as a portion of national income.

Third, an ever-increasing slice of investment is being siphoned off by spending mandated by government regulations, such as purchases of pollution-control equipment which adds nothing to output potential. Private sector compliance with government regulations exceeds $100 billion per year.

Fourth, much of the new investment is needed just to keep plant and equipment growing to match labor force increases. Productivity depends on capital per worker, so plant and equipment must increase faster than the labor force expands in order for productivity to increase.

The net result of these four factors is that the real growth rate of capital has been reduced almost to zero. But the situation is not hopeless. With bold new policies, we could have the massive new investment in America that would send productivity up and cut into the double-digit inflation rate.

The first imperative is a balanced budget to stop Government from crowding private borrowers out of the market for available investment funds. Despite recent rhetoric about frugality, we have seen $116 billion in budget deficits in the past three years.

Next, we must alter depreciation schedules to allow business to recoup the full real value of equipment as it wears out. As Treasury Secretary G. William Miller told the Joint Economic Committee, "The depreciation allowances now in place are insufficient to fund replacement of plant and equipment, not to mention either expansion of capacity or modernization with new technology."

Another requirement is enactment of a regulatory budget that would require the President and Congress to consciously decide each year how much private sector investment potential is to be diverted into compliance with government regulations.

Finally, we must turn our attention to the disgracefully low level of personal saving, which has declined to three percent from its historic six percent level. The U.S. savings rate is the lowest in the industrialized world. It's no coincidence that we are also last in investment, productivity growth and real wage increases.

The reason for our poor savings performance is high taxes on savings income. We need new incentives that give Americans a real return on their savings after inflation and taxes. One of the simplest ways to do this would be to tax interest earnings separately from wages, so that lower tax rates would apply, instead of tacking interest earnings onto wage earnings and pushing taxpayers into higher tax brackets. We need more than the $200 interest exemption passed by Congress, because this small tax break will provide no incentive to most taxpayers to do additional saving.

For the American wage-earner, failure by policymakers to address our productivity problems will mean a future marred by continued high inflation and little hope for a rising standard of living, a prospect as bleak as it is unnecesary.

However, productivity growth at rates experienced in the 1950's and 1960's need not be a thing of the past. With the right policies -- those advanced by the Joint Economic Committee in its Annual and Midyear Reports; namely, reduced tax rates to stimulate work effort, savings and investment; reduced Federal spending relative to GNP and reduced regulatory burdens -- we can have growing productivity, real GNP growth, real after-tax wage increases and a rising standard of living for all Americans in the decades ahead.

Contents of Volume

The following outline contains a list of titles and authors of papers which will appear in the final printed volumes of the Productivity section.

Section 1 -- Productivity: The Issues

1. The Determinants of the Decline in Measured Productivity Growth: An Evaluation (Gregory B. Christainsen; Robert H. Haveman, University of Wisconsin-Madison)

2. The U.S. Economy and Productivity: Where Do We Go From Here? (C. Jackson Grayson, Jr., Chairman, American Productivity Center)

3. Productivity, Inflation and Economic Growth (L. Douglas Lee, Data Resources, Inc.)

4. Problems with the Measurement of Productivity (James L. McIntire, Senate Committee on Labor and Human Resources.)

Section 2 -- Policy Alternatives and Productivity Improvement

1. Increasing Productivity in the United States: Ways in Which the Private and Public Sectors Can Contribute to Productivity Improvement (Julius W. Allen, Economic Consultant to Economics Division, Congressional Research Service)

2. Impact of Selected Capital Investment Incentives on U.S. Industrial Growth (Vijaya G. Duggal; Michael McCarthy; Anthony Haidorfer; Mark Killion, Wharton EFA, Inc.)

3. Policies to Bring Core Inflation Down to 5% (Otto Eckstein, President, Data Resources, Inc.)

4. Results of Capital Spending Surveys Conducted by McGraw-Hill and Gallup Economic Services

Section 3 -- SSEC Productivity Hearings, June 1978.

1. **Statement and prepared statement of Edward F. Denison, U.S. Department of Commerce**

2. **Statement and prepared statement of Michael K. Evans, President, Evans Economics, Inc.**

3. **Statement and prepared statement of Solomon Fabricant, Professor of Economics Emeritus, New York University**

4. **Statement and prepared statement of John W. Kendrick, Professor of Economics, George Washington University**

5. **Statement and prepared statement of George H. Kuper, Executive Director, National Center for Productivity and Quality of Working Life.**

6. **Statement and prepared statement of Jerome A. Mark, Assistant Commissioner, Office of Productivity and Technology, Bureau of Labor Statistics, Department of Labor.**

7. **Statement and prepared statement of Jerome M. Rosow, President, Work in America Institute, Inc., Scarsdale, N.Y.**

PRODUCTIVITY:
The Foundation of Growth
I

THE PRODUCTIVITY PROBLEM IN PERSPECTIVE

Productivity is a measure of how efficiently people and equipment are used to produce goods and services.*

In 1903, when Henry Ford founded his company, it took 13 hours to produce one car. By 1913, it took one hour. By 1980, 60 cars could be produced in that single hour. That is productivity growth.

Today, using hybrid seed, American farmers can produce at least 20 percent more corn on 25 percent fewer acres than was the case in 1930. That is productivity growth.

Today, hand-held calculators pack as much computational ability as room-sized computers of the 1940's. Many more people have access to these calculators, and when they use them, they save time. That is productivity growth.

Productivity growth means that available resources -- labor, land, materials, plant and equipment -- can produce more than they did before. It means that less time is required to produce a more efficient, safer and more convenient automobile, to prepare a more nutritional meal, or to take a coast-to-coast trip.

Productivity growth means resources are freed to produce other goods and services that could not otherwise have been produced. Productivity growth means more leisure. But, most important, productivity growth means a rising standard of living.

---

* Specifically, productivity is a measure of output per unit of input, usually measured in terms of output per worker hour.

The Productivity Record

From 1948 to 1979, real gross national product (GNP) grew at an annual rate of 3.5 percent. During this period, productivity -- or output per worker hour -- rose at an average rate of 2.3 percent.

The growth of productivity was not, however, steady. From 1948 to 1965 productivity rose at a 3.0 percent rate, declining to 2.1 percent between 1965 and 1973. And, since the Oil Embargo of 1973, productivity growth has dropped to roughly 0.7 percent per year. Finally, productivity actually declined during 1979 at the rate of 0.9 percent.

A major factor contributing to the productivity decline has been the growth in employment relative to plant and equipment or "capital." During the period from 1948 to 1965 employment grew at a 1.2 percent annual rate, while capital grew at a 2.3 percent rate. Between 1965 and 1973 the growth rate of employment and capital accelerated to 2.2 and 3.0 percent, respectively. But the post-Oil Embargo period saw the growth rate of the Nation's capital stock *fall* to 1.3 percent, while employment grew at 2.3 percent per year. With employment increasing at a 2.3 percent annual rate, and capital increasing at only 1.3 percent, productivity growth declined after 1973. Put another way, over the 1948-1965 and 1965-1973 periods, the capital-labor ratio actually grew (at 1.9 and 1.4 percent annual rates, respectively). However, during the 1973-1979 period the ratio *declined* at an 0.6 percent annual rate. In effect, businesses are increasingly substituting labor for capital and for energy. The substitution process seems, moreover, to be growing stronger. Between 1978 and 1979 the capital-labor ratio declined at an even faster 1.5 percent annual rate.

In contrast, capital available per worker in Japan and Korea increased during the 1960's and 1970's by more than 10 percent per year. In Europe and many developing countries the annual growth in capital per worker was more than 4 percent. According to the recently released White House "Study of U.S. Competitiveness," the result is that "the United States dropped from first to sixth place in the ranking of countries according to the amount of capital per worker available." This is partly responsible for the substantial erosion of U.S. competitiveness in international markets. *

* The September 1980 White House Study argues that "The increased international competition facing U.S. producers is mainly the result of changing resource supplies and technological capabilities. Because of higher rates of growth in investment and expanded research activity in other countries, the United States experienced a RELATIVE decline in its trade performance over the past two decades even though the level of U.S. exports has increased substantially in recent years."

If there is little doubt that the decline in the capital-labor ratio has reduced the Nation's competitiveness, there is even less doubt that it has contributed to the erosion of productivity. The decline in the capital-labor ratio has been accompanied by an abrupt decline in productivity growth. Whereas output per worker hour increased at a compound annual rate of 2.9 percent between 1960 and 1970, it increased at the substantially lower annual rate of 1.4 percent between 1970 and 1979, and at the still lower rate of 0.7 percent after 1973.

Productivity and Real Per Capita Incomes

Real per capita income is one measure of Americans' standard of living. During the last decade, real per capita income rose by 2.4 percent annually to $6476 in 1979. In comparison, the same income rose 2.6 percent in the 1960's, but that was in a decade when population growth was much greater than in the 1970's. When population growth is high, per capita income gains tend to be smaller. When population growth is low, per capita income gains -- coupled with an expanding economy -- tend to be larger. Had the economy been expanding more rapidly in the 1970's, during a period of declining population growth, real per capita income would have been much greater than $6476.

If productivity performance is as poor during the 1980's as it was during the 1970's, real per capita income growth would be halved, falling to about 1.2 percent.

Continued slow productivity growth would mean that, by 1990, real per capita income would reach only $7410.

While this would be 14 percent above its 1979 level, it would be considerably below what could be achieved. If productivity growth is encouraged -- if appropriate tax, energy, regulatory and other policies are marshalled -- 1990 per capita income could reach $8150 (in constant dollars), fully 10 percent higher than the continued slow productivity growth trend, and 26 percent higher than its 1979 level.

Achieving this level of per capita income will not be easy. It will require that, during the 1980's, real gross national product (GNP) grow at about 3.0 percent per year, that the Nation's capital stock (its plant and equipment) expand at 3.8 percent per year, and that the share of investment in GNP rise to 12 percent.

Just as productivity growth is necessary to increase per capita income, investment in new plant and equipment and in improved workers' skills is critical if productivity increases are to be accelerated. The long-run effects of a slowdown in capital formation and investment in human resources, and thus productivity growth, extend to every American. At minimum, continuation of the 1970's trend will see a deepening of America's pervasive international competitiveness decline that is seen most clearly in the increasing influx of Japanese and German automobiles, radial tires from France, textiles from Hong Kong, Japanese television sets, Italian shoes and foreign bicycles, motorcycles, flatware and machine tools, because the major force that drives this wave of foreign competition is productivity growth more rapid than that in the United States.

Since World War II, real GNP has grown at a 3.5 percent annual rate. Of this 3.5 percent total, 1.6 percentage points are accounted for by the growth of the Nation's stock of machinery and equipment. The remaining 1.9 percentage points are attributed to increases in productivity (1.1 percentage points) and to increases in employment (eight-tenths of a percentage point). Clearly, 46 percent of the growth in GNP is explained by increases in capital formation, and thus much of the Nation's standard of living increase is directly attributable to investment in plant and equipment.

The following staff study not only explains how investment is a source of economic growth and, thus, of improved standards of living; it presents the link between investment and technological change, a conduit of economic progress; and the links between regulatory, energy and other policy, and the ingredients of faster productivity growth.

Once the connections are understood, the study proposes policy prescriptions which offer the best hope for the achievement of America's full productive powers.

II

WHY PRODUCTIVITY HAS DECLINED

A Tendency to Consume Rather than to Save

The productivity decline has no single cause. Rather, declining productivity growth is the consequence of an environment that encourages consumption rather than saving, and that discourages investment and production. Declining productivity growth is the consequence of an environment that has seen the United States' ratio of saving to disposable income fall below that of any other major industrial nation -- less than one-fourth the averages for Italy and Japan; only one-third that of France, Germany and the United Kingdom, and less than one-half that of Canada.

Many factors contribute to this environment. Inappropriate monetary and fiscal policies play a role, as does government regulatory activity. Inadequate tax treatment of depreciation is a negative influence on investment, and therefore on productivity growth. Declining R&D spending has had a negative impact, as has the rapid rise of energy prices. And, inflation has worked both directly and indirectly to reduce productivity growth.

Inflation does not simply erode real incomes. It encourages consumption and discourages saving because -- anticipating higher prices in the future -- consumers and businesses buy now rather than later. The result is a surge of anticipatory buying that adds to inflationary pressures. To finance these purchases, consumers and businesses borrow and draw down savings that might otherwise have been used to finance investment projects. But reduced savings and increased borrowing are generally not sufficient to maintain consumption patterns in the face of rapidly rising prices. Wages must rise to compensate for higher prices. Typically, however, wage increases designed to compensate for past and anticipated price increases exceed productivity gains. The result is increases in unit labor costs, and still more upward pressure on prices. The combination of buying in anticipation of future price increases and rising unit labor costs is self-defeating. In the end, all that is achieved is that more kindling is thrown on the inflationary fires: As prices go up, anticipated inflation becomes a reality. The result is more anticipatory buying, and continuing catch-up wage demands. Unfortunately, wages cannot "catch up." Rising wages, along with higher energy and materials prices, push up the costs of production and restrain the growth of output. At the same time as buyers seek to purchase more, the supply of goods and services begins to grow more slowly. The result is still more inflation, leading to demands for still higher wages and a continuation of the vicious cycle.

Management, Labor and Government

Part of the fallout of the vicious cycle of inflation, increased consumption spending, declining saving and investment, and rising unit labor costs has been the slower growth of output and the erosion of real incomes. Declining real incomes have been accompanied by the ascendancy of special interest groups. With real incomes declining, interest in long-term growth waned; interest in the protection of income shares increased.

At the most basic level, distrust and antagonism have tended to choke off labor-management cooperation essential to the identification of ways to improve productivity on a day-to-day basis. At another level, government is increasingly perceived to be in direct competition with the private sector for access to and use of increasingly scarce resources.

All of this is congenial neither to faster productivity growth nor to faster economic growth. Government mandates cannot change the situation, but the provision of an environment of economic stability will help through:

- A declining share of government in GNP.
- Steady reductions in the growth of the money supply.
- Cost-effective regulatory initiatives.

In short, policies that encourage the growth of real incomes are essential.

Short-Term Vs. Long-Term Thinking

If inflation encourages consumers to buy now rather than later, to save less, and to demand wage increases now rather than later, it also shortens the planning horizons of businesses. At the least, inflation discourages the risk-taking associated with long-term investment projects which could provide more modern and efficient equipment. Inflation simply makes long-term investment riskier. Both the estimates of the revenues that an investment might generate, and the costs that will have to be absorbed, are less predictable. Investment projects with quicker payouts become more attractive both because revenue and cost forecasts extend over a shorter (and presumably more foreseeable) planning horizon, and because profits generated further in the future by long-term investments are likely to be eroded by inflation. The investment emphasis then turns to other expansion opportunities (the modification or acquisition of *existing* products and production processes), rather than upon the development of new products and processes which can boost productivity.

The acceleration of inflation has been accompanied by a flurry of merger and "take-over" activities. In the mid-1960's the average valuation ratio -- the ratio of the market value of a corporation's stocks and bonds to the replacement cost of its assets -- was approximately one and one-quarter. That is, in the mid-1960's, corporate plant and equipment was being valued in the market at one and one-quarter times its replacement cost. By the late 1970's, the ratio had fallen to less than three-quarters, meaning that corporate investments were being valued, on average, at less than three-fourths the cost of replacement. In effect, inflation was driving replacement costs up faster than the market value of corporations' stocks and bonds. Under these circumstances it is easy to see why corporate managers have had an easier time selling boards of directors on the idea of acquiring other companies in order to expand, rather than undertaking the costs (and the risks) associated with the start up of new enterprises.

The tendency to think on a short-term basis has not, however, been limited to the private sector. Both the monetary and the fiscal authorities have been inclined to focus on the near-term, rather than upon the provision of an environment that is congenial to long-term economic growth.

Monetary policy has had a great deal to do with the price explosion that has eroded real incomes, slowed investment, and contributed to the decline of productivity growth. True, the monetary authorities did not set in motion the massive energy price increases that have been so important a part of the inflationary process. But the monetary authorities did over-accommodate those rising energy prices by increasing the growth of the money supply. And it was the monetary authorities who underwrote the explosion of credit without which the wave of anticipatory buying could not have been financed. But, above all, it has been the disposition of the monetary authorities to employ stop-go policies - monetary expansion when unemployment was rising, and monetary contraction when the inflation rate was rising -- that has been most detrimental to decision-making generally, and to long-term investment in particular.

The attempts of the monetary authorities to "fine tune" flies in the face of two fundamental facts:

(1) Over the long term, there is no trade-off between inflation and unemployment. Rather, increases in the inflation rate lead, inevitably, to increases in the unemployment rate. As a result, a willingness to accept an increase in inflation as the price of reducing unemployment is self-defeating. Eventually, the surge of price inflation must translate to an increase in unemployment.

(2) Attempts to manage demand through adjustments in the growth rate of the money supply and changes in the level of interest rates affect supply as well. The supply effects are complex, having to do not only with output decisions by business firms, but labor supply decisions by workers and potential labor force entrants. And, very importantly, the supply side effects of demand management include the impact of stop-go policies on investment decisions.

Fundamentally, the problem is that the monetary authorities have consistently viewed investment spending as a component of the *demand* for goods and services. As such, investment spending becomes something to be "managed," in the same sense as consumption is managed.

But this is wrong. Investment spending is *not* the same as consumption spending. Increases in net investment -- investment spending that results in expansion of the capital stock and in increases in productivity -- result in increases in the Nation's productive capacity. Increases in consumption spending do not have this effect -- unless the increased consumption spending is a catalyst to more investment spending. But it is precisely this tendency to lump together elements which do not have the same effects that has contributed to a deterioration of the investment climate, an acceleration of inflation, and a decline in productivity growth.

Since 1973, net investment has actually *declined* at a 1.6 percent annual rate. The combination of high and variable inflation rates, inadequate tax treatment of depreciation, and stop-go fiscal and monetary policies are among the culprits.

But if the monetary authorities must shoulder part of the blame for the decline in net investment -- and therefore for part of the decline in productivity growth -- the fiscal authorities are to blame as well.

It is not simply that the fiscal authorities have been as enamored of "demand management" and of stop-go policies as have been the monetary authorities. Fundamentally, it is that the fiscal authorities -- like the monetary authorities -- have ignored the supply side. They have for too long embraced the same narrow view of investment. They have regarded investment spending as a component of aggregate demand. As such, investment spending, like consumption spending, was "managed" in the never-ending cycle of boom and bust. The missing element was not simply recognition of the supply side aspect of investment spending, but recognition of the implications for long-term economic growth implicit in the deliberate manipulation of investment spending. The deliberate slowing of consumption spending is one thing; the deliberate squeezing of investment spending is quite another.

Recognition of the need to develop a delicately balanced economic policy through increased emphasis on the supply side, while increasingly widespread today, is not altogether new.

President Kennedy saw the developing balance of payments problem and -- although the real deterioration of merchandise trade was still 10 years away -- he had the vision to sense the future and the need for new policies. In a special April 20, 1961 tax message, Kennedy offered the new concept of a 15 percent tax credit on all new plant and equipment investment. His proposal was unsuccessful in 1961, but he was back again in 1962 -- this time with a successful capital formation program which provided a business tax cut estimated at $1.5 billion in the first year.

Following enactment of that tax bill, on December 14, 1962, the President said: "Our present tax system exerts too heavy a drag on growth -- it siphons out of the private economy too large a share of personal and business purchasing power, it reduces the financial incentives for personal effort, investment and risk taking." In order "to increase demand and lift the economy, the Federal Government's most useful role is not to rush into a program of excessive increases in public expenditures, but to expand the incentives and opportunities for private expenditures."

That was the new theme of taxation, seemingly based on President Kennedy's gut understanding of supply and demand balance.

President Kennedy achieved widespread understanding and support for the concept of tax reduction to help promote economic growth, but the specifics became embroiled in dispute. Complexity of detail amidst cross currents of old ways of looking at tax policy intermingled with a complacency about the need for action.

It does no good to consider what might have been, but President Kennedy was close to the present day idea that tax reduction does not simply stimulate demand. Tax reduction does not result solely in an increase in consumption and investment spending. Tax cuts that stimulate investment spending result in increases in the Nation's stock of physical capital. This, in turn, increases productivity and the Nation's productive capacity.

If the Nation is to have any chance of meeting its economic and social goals, the economy will simply have to grow faster. Fiscal and monetary policies have an important role to play in accelerating economic growth. But it is a role that can be played only if policymakers understand the supply side implications of what they do, if they abandon the stop-go policies of the past, and if they substitute instead a commitment to growth; a commitment to the establishment of an environment of policy stability.

Central to the development of economic policies that are congenial to economic growth -- to increases in saving, investment and productivity -- is a steady monetary policy with gradual reductions in the growth rate of the money supply. Equally important will be a commitment to gradually reduce the share of government expenditures in gross national product (GNP), and the systematic modification of the tax code to provide incentives to invest, to save and to produce.

The Proliferation of Regulations

Failure to take account of the implications of policy changes for the supply side have not been limited to the fiscal and monetary authorities. Part of the decline in net investment and in productivity is due to the way in which regulatory initiatives have been promulgated and implemented.

Environmental and health and safety regulations generate benefits, but they also generate costs. The satisfaction of environmental regulations typically involves higher capital and operating costs. In the case of capital expenditures -- spending on new plant and equipment -- benefits may take the form of cleaner air or water *and* an improvement in measured productivity. It is conceivable, in other words, that the satisfaction of environmental or other regulations may, over time, result in reduced operating costs. But it is also true that capital and operating costs may rise, with no compensating increase in measured productivity. In this event, the absorption of unnecessarily high regulatory costs does not simply contribute to inflation; it constitutes an unnecessary drag on employment, output, productivity and, ultimately, on economic growth.

The problem has been that the attention of the regulatory authorities has for too long centered on regulatory goals without sufficient regard for short- and long-term costs. Increases in current operating costs restrict output and employment growth. Increases in projected costs, coupled with the uncertainties associated with regulatory processes, act to retard investment.

Regulations would not be promulgated if there were not agreement that they will generate benefits. But the rational achievement of regulatory objectives requires that they be efficiently attained and that the costs of satisfying regulations be minimized. A commitment on the part of government to minimize regulatory compliance costs should be a keystone of economic policy. This would require that -- in addition to consideration of regulatory objectives -- government at all levels take account of the implications of regulatory initiatives for product prices, employment, production and investment. This would help reduce regulatory uncertainties, and would serve to minimize any negative impact of regulation on productivity and economic growth.

Sluggish R&D Growth

Inflation, stop-go economic policies and an uncertain regulatory environment have all contributed to the decline in net investment. This has translated directly into a reduction in productivity growth. But declining productivity growth is related to another trend -- a decline in research and development (R&D) spending -- that is itself a reflection of high and variable inflation, and of unsteady economic policies.

Total spending for R&D by industry, government and universities dropped from 3 percent of GNP in 1964 to 2.3 percent in 1979. While the relationship is difficult to quantify, evidence is that R&D expenditures and productivity growth are positively related because R&D expenditures are the source from which many technological innovations arise.

The decline in R&D spending is largely explained by a reduction in space-related research. But, while R&D spending by industry has remained relatively stable as a percent of GNP, the nature of the spending that does occur has changed. The R&D that is conducted by industry has shifted away from longer-term research and toward short-term development projects; toward the modification of existing products and processes. R&D, after all, has the character of an investment and, like all investment spending, it reflects the short-term emphasis engendered by inflation, by stop-go monetary and fiscal policies, and by regulatory uncertainties. Equally important, much of the industrial R&D that does occur is devoted to regulatory compliance.

The purpose of R&D is to generate new knowledge that, ideally, will be translated into new products or production techniques. R&D is an engine of technological change. But if R&D is the engine of technical change, investment in physical and human capital is the vehicle. Without investment either in human or in physical capital, technological change would be limited to plant floor innovations; innovations that, while important, involve the modification and use of existing plant and equipment. This would slow the rate of technological advance and, with it, slow the rate of productivity growth, because new technology is generally embodied either in new plant and equipment, or in the newly acquired knowledge and skills of the work force.

R&D and investment are motive forces behind technological change, and therefore behind productivity increases. Anything that slows the rate of technological change -- that slows the conduct of R&D activities, or that reduces new investment growth -- therefore reduces productivity growth.

The Rapid Rise in Energy Prices

The triad of high and variable inflation, stop-go economic policies and an uncertain regulatory environment has wreaked havoc with investment and with R&D activity. But if one particularly troublesome villain were to be singled out, it would likely be the precipitous rise in energy prices.

Energy prices are important determinants of the rate of technological advance, and hence of productivity growth. The vast majority of America's industries -- whether farming, manufacturing, or non-farm, non-manufacturing -- are heavily dependent upon energy. They are dependent in the sense that in these industries, improvements in technology -- and hence in productivity -- depend upon increases in the relative importance of energy in these industries' production processes. Technological change in these industries involves the use of more energy-intensive production processes in which energy becomes a larger component of total costs.

Clearly, then, increases in the relative price of energy impede the rate at which new technology is adopted. As a result, energy price increases slow the rate of technical advance and, with it, the rate of productivity growth. Energy price increases are not simply a burden on consumers and on business; they are a brake on economic growth.

But if energy price increases have retarded productivity growth, so has uncertain energy availability. Excessive reliance on insecure foreign energy sources has increased the riskiness of investment in energy-intensive production processes that might otherwise have increased productivity. In short, both energy price increases and the uncertainty associated with adequate energy supplies have slowed the rate of productivity advance, although the uncertainty of energy supplies has begun to diminish.

The gradual decontrol of domestic oil and gas prices has already begun to unleash domestic oil and natural gas exploration. Price incentives, coupled with passage of the Energy Security Act and other policy initiatives, will serve to underwrite synthetic fuel production, to encourage the use of coal and other non-oil fuels, and to stimulate more aggressive energy conservation.

All of this, it is hoped, will serve to reduce U.S. reliance on insecure foreign energy sources and to slow the rate of increase of Organization of Petroleum Exporting Countries (OPEC) prices. To the extent that these policies succeed, the rate at which American industry adopts new technology will increase. The result will be more rapid productivity growth and more rapid economic growth.

But more should be done. Energy policy should be broad-based, encouraging the development of more domestic as well as secure foreign energy sources. And it should encourage the ever more efficient use of energy. Without policies which slow the rate of increase of energy prices, productivity growth will be very, very difficult to achieve.

Plant and Equipment

Partly as a result of inflation, and partly as a result of tax and other disincentives to invest, the United States has increasingly fallen behind its major industrial competitors. During the 25 years after World War II, roughly one-third of Japan's growing national product flowed into new machinery and equipment. In the case of Germany, France and Italy, fixed capital investment ranged from one-fifth to one-fourth of their GNP during the same period. The

United States, on the other hand, was dead last among all major industrial nations, with a capital to GNP ratio roughly half that of Japan.

The causes of the neglect of plant and equipment investment are a tangled, interrelated web. The tendency to consume rather than to save reduces the growth of the pool of investable funds. The tendency to think short-term rather than long-term biases decisions away from long-term investment in plant and equipment, in R&D and in human capital. The proliferation of regulations increases costs and uncertainty. The rapid rise of energy prices, coupled with the question of energy availability, reduces the rate at which new technology is adopted. And interwoven in this web is a tax system which is itself a barrier to plant and equipment investment.

Under current tax laws, businesses are allowed tax deductions based on the historic cost of plant and equipment; that is, the purchase price of equipment and the construction of plant. The result is that a plant which might have cost $1 million upon completion is being depreciated, years later, at its original cost, and not its current replacement value. The problem is that inflation will have pushed the plant's replacement cost above its original cost. As a result, depreciation allowances -- tax deductions intended to assist in the provision of funds for the renewal of plant and equipment -- are too small. Yet, because depreciation allowances are too small, profits are overstated. Therefore, taxes paid are too large, and less money is available for reinvestment in plant and equipment.

Tax policy should have as a partial objective the provision of incentives to roll over plant and equipment more often; ideally, at a rate which allows U.S. industry to compete with foreign producers whose average age of industrial equipment ranges roughly from 10 to 14 years. This stands in sharp contrast to the average age of America's industrial equipment, now running over 20 years. (In some major, mature industries such as steel, paper and pulp, foundries and forge shops, much of the equipment is 50 or more years old).

The connections among productivity, the tax system, and retaining more earnings in the private sector will be further explored below. There is, in any event, a clear need to retain more earnings in the private sector so as to revitalize the Nation's industrial base, rather than to collect these earnings as taxes to fill the all too often leaky public sector bucket.

III

THE MEASUREMENT PROBLEM

The evidence that productivity growth is declining is based upon long-term trends. It is the productivity *trends* that are meaningful, rather than a particular measure of productivity at a particular point in time.

The measurement problem has many dimensions. It is a problem of knowing how to measure outputs and inputs where -- even within a particular industry -- quality and other differences distinguish one unit of output from another, and skill levels are different among employees doing the same job. The measurement problems are manifestly more complicated in the service sector, the sector of the economy that is growing most rapidly. To illustrate, in the case of the legal profession, no two wills are the same, and the number of worker hours required to prepare a legal brief will necessarily vary depending upon the complexity of the issues involved and the knowledge and skills of the lawyer.

Partly because of measurement problems, productivity statistics must be carefully interpreted. For example, some things that should be included in productivity measures are not, generally, for the very plausible reason that no one knows exactly how to measure them. An example is environmental improvements. Worker hours are employed in the process of improving air and water quality, but the fruits of that labor -- the improved air and water -- are not a part of the *measured* output of the economy. As a result, where the worker hours used to produce environmental improvements are counted, but the environmental effects are not, productivity is underestimated.

Differences in skill levels are a particularly troublesome part of the measurement problem. During the 1970's the American labor force swelled at a 2.5 percent annual rate. Employment grew at a 2.4 percent annual rate, with much of the increased employment involving first-time entrants into the labor force. Many of the newly employed were either the young products of the postwar baby boom, or women seeking employment for the first time outside the home. Lacking the training of older, experienced workers, these new job market entrants did not possess comparable skills. Yet, most productivity statistics do not take account of these differing skill levels. While many of these demographic effects will become less important in the 1980's -- the labor force will grow somewhat less rapidly, there will be relatively fewer young workers, and workers are now gaining experience -- the fact remains that failure to take account of differing skill levels can result either in over or underestimates of productivity.

Partly because of the measurement problem, the scope and significance of the declining productivity trend has only lately come to be realized. The ambiguities of individual productivity numbers tended to obscure what the productivity trends clearly articulated: The efficiency of resource use has been gradually eroding. The fact that the developing evidence did not elicit a more rapid response suggests the need to come rapidly to grips with the causes of the productivity decline and to improve the quality of the radar by improving the various productivity statistics. The measurement problems are not insurmountable. But to overcome them will require the mobilization of technical skills, determination, and a great deal of ingenuity. Resolving the various productivity measurement problems is a challenge to professional economists and to managers, labor and government. It is a challenge to all those interested in efficient resource use, the growth of real incomes, and the competitive position of the U.S. economy.

IV

PRODUCTIVITY AT THE SECTORAL AND INDUSTRY LEVELS

An understanding of the scope and significance of the productivity decline hinges upon an appreciation of productivity trends not only at the national level, but at the sectoral and industry levels as well.

The economy's major sectors include the private domestic business economy, farming, manufacturing, and non-farm, non-manufacturing industry. A comparison of data for the periods 1948 to 1973 and 1973 to 1978 indicates the following:

- Output per worker hour is increasing less rapidly in each of the four sectors.
- The growth rate of output per unit of capital is down in three of the four sectors. The exception is farming, where it is now increasing (it had been falling during the 1948-1973 period).

Again, comparing the data for the 1948-1973 and 1973-1978 periods, it is found that, among manufacturing industries:

- Output per worker hour is increasing less rapidly in 16 of 20 industries, with output per worker hour actually declining in primary metals and instruments.
- Output per unit of capital is increasingly less rapidly in 16 of 20 industries. Moreover, output per unit of capital is declining in 12 of 20 manufacturing industries.

As for the non-farm, non-manufacturing industries (again comparing the 1948-1973 and 1973-1978 periods), the data indicate that:

- Output per worker hour is increasing less rapidly in eight of nine industries, with the only exception being communications. Output per worker hour is actually declining in mining, contract construction, finance and insurance and real estate.
- The growth rate of output per unit of capital has declined in three of nine industries, with actual declines in capital productivity in public utilities, trade, finance and insurance.

The Implications

Where measurable, the decline of the Nation's productivity can be traced to the erosion of productivity growth at the sectoral and individual industry levels.

The most obvious effect of this broad-based productivity decline is a reduction in the growth rate of national output. This is because the rate of growth of output for the U.S. economy as a whole is dependent upon the growth rates of capital and employment, and upon the growth rate of productivity.

Over the postwar period real GNP grew at a 3.5 percent annual rate. The 3.5 percent growth rate can be explained as follows: 1.6 percentage points are accounted for by the growth of capital -- by increases in machinery and equipment; 0.8 percentage points are contributed by the growth of employment, and 1.1 percentage points are explained by increases in productivity. Over the post war period, then, the growth of the capital input has made the most important contribution to the growth of output, followed by productivity and employment growth.

Since 1973 the growth rate of output has fallen to a 2.5 percent annual rate. This should come as no surprise, given the role in economic expansion of productivity growth, and of increases in the amount of capital and labor employed. Relative to the 1948-1973 period, since 1973:

- The capital input growth rate has declined in each of the four major sectors of the economy. The most broadly defined sector -- the private domestic business economy -- experienced a decline in the annual growth rate of capital from 2.5 percent during the 1948-73 period to 1.9 percent after 1973.
- Employment growth has accelerated in the private domestic business economy and in the non-farm, non- manufacturing industries. In the case of manufacturing, employment growth has declined, while in farming, the rate of decline of employment has fallen.

The net effect has been that the growth rate of the capital-labor ratio has declined in three of the four major sectors. Only manufacturing has experienced a slight increase. Moreover, the capital-labor ratio is actually declining in the private domestic business economy and in the non-farming, non-manufacturing industries.

All of this has been accompanied by the decline in the growth of labor productivity noted above. The result is, then, that the growth rate of output has declined dramatically in three of the economy's four major sectors. Only farming has enjoyed an increase in its output growth rate.

While the sectoral data are helpful, industry data are even more revealing. The four major sectors of the economy are, after all, comprised of individual industries whose investment and employment decisions necessarily have an impact upon national productivity performance. In the case of the manufacturing sector, a comparison of the 1948-1973 and 1973-1979 periods reveals that:

- The capital input growth rate declined in 12 of 20 industries, with the capital input actually declining in the leather and miscellaneous manufacturing industries.
- Employment growth declined in 13 of 20 industries, with employment actually declining in 12 industries.

The corollary has been that the capital-labor ratio is increasing less rapidly in 11 of 20 manufacturing industries, and is actually declining in the instruments and miscellaneous manufacturing industries. Partly because of the decline in the capital-labor ratio, output per worker-hour is down in 16 of 20 manufacturing industries. As a result, the real output growth rate has declined (relative to the 1948-1973 experience) in 17 of 20 manufacturing industries.

The experience of the non-farm, non-manufacturing industries has been similar:

- The capital input growth rate has declined in seven of nine industries, with the capital input actually declining in contract construction.
- Employment growth has increased in eight of nine industries, while remaining roughly constant in contract construction.
- With capital input growth down and employment growth up, the capital-labor ratio growth rate is down in each of nine industries. Worse still, the capital-labor ratio is actually declining in mining, contract construction, transportation, real estate and services, and the growth rate of real output is down in seven of nine non-farm, non-manufacturing industries.

V

THE DECLINE OF NET INVESTMENT

The decline in productivity growth at the national and at the sectoral and industry levels has had many causes, with the common denominator obviously being the decline in the amount of capital available to America's workers.

Between 1960 and 1970, net nonresidential investment (investment in structures and in producrs durable equipment) increased at a compound annual rate of 7.4 percent. Between 1970 and 1979 the growth rate of net investment fell to 1.8 percent, so that net investment grew during the 1970's at roughly one-fourth the rate at which it increased during the 1960's. But it is the post-oil embargo experience that has been particularly devastating:

Since 1973 net investment has declined at a compound annual rate of 1.6 percent.

While the growth rate of net investment was declining, employment was growing at an accelerating rate: Between 1960 and 1970 employment grew at a 1.8 percent annual rate. Since 1970 the growth rate has been 2.4 percent, one-third faster than during the previous decade.

The reasons for the increase in the growth rate of employment are themselves complex; reasons which are explored in the Human Resources and Energy and Materials sections of the Special Study on Economic Change (SSEC). Suffice it to say that the implications of the relatively more rapid growth rate of employment are not only a decline in the amount of capital available to workers, but a decline in productivity growth, as seen in the following table.

COMPOUND ANNUAL GROWTH RATES

	Net Investment[1]	Employment	Productivity[2]
1960-1970	7.4	1.8	2.9
1970-1979	1.8	2.4	1.4
1973-1979	-1.6	2.3	0.7

1. Net Nonresidential Domestic Private Investment.
2. Output per hour, all persons, Private Business Sector.

Given the growth of employment, this central question is posed: What is it that accounts for the decline not only in the growth rate of net investment, but for its actual decline?

The root cause of the decline in net investment is inflation. On the one hand, inflation interacts with the tax system to reduce the funds *available* for investment. On the other hand, inflation foreshortens the focus in decisionmaking; it encourages a short rather than a long-term view of investment decisions.

Inflation, Tax Policy and Investment

Under current tax law, businesses are allowed certain tax deductions based on the "historic cost" of their plant and equipment. (The idea behind these tax deductions is that some allowance should be made for the fact that machinery and equipment wear out, and that replacement will eventually have to occur.) But with inflation pushing current replacement costs above the historic cost of plant and equipment, two things happen. First, because depreciation allowances are based upon the *purchase* or historical prices of existing plant and equipment, current depreciation allowances are *under*stated Second, because depreciation allowances are too small, expenses are understated, and current profits are *over*stated. With profits overstated, taxes paid will also be too large, leaving less money to be distributed to shareholders, or to be reinvested for future growth.

The nub of the problem is that when the inflation rate rises, the real value of depreciation allowances is reduced. This has the effect of diverting into taxes dollars that would otherwise have been available for reinvestment. As a result, inadequate depreciation allowances reduce the *amount* of investment. But they also distort the *composition* of the investment that does occur.

Over time, longer-lived plant and equipment suffer larger declines in the real value of depreciation allowances. As a result, the interplay of high and variable inflation rates and inadequate depreciation allowances result in a bias against longer-lived projects. In effect, the planning horizons of businesses become shorter. The result is that investment projects that might have yielded significant future benefits -- particularly in the form of higher productivity -- are rejected in favor of projects yielding faster payoffs.

Inflation contributes in yet another way to the discouragement of long-term investment. A key determinant of investment decisions is profits which investors expect to earn on their investments. The calculation of expected profits hinges upon sales and cost projections. However, because high and variable inflation rates make sales and cost projections less certain, they make expected profit calculations more tenuous. Inflation, therefore, increases the riskiness of business investment. Thus, many projects that would otherwise have been undertaken are abandoned. Among the most likely candidates for abandonment are long-lived projects whose expected payouts extend over a long period of time. The ultimate impact of inflation is therefore to foster a short-range, minimum risk view; to encourage businesses to concentrate on the present at the expense of the future.

If inflation biases businesses' investment decisions, it also alters savers' decisions. In broadest terms, high and variable inflation rates encourage consumption spending and discourage saving. Inflation therefore affects the *amount* of saving, while also affecting its *composition.*

Because of inflation, effective tax rates on capital gains and on interest income have increased dramatically. Savers who purchased stocks and bonds now pay tax rates of 100 percent or more on their real returns. This obviously discourages saving. When coupled with the inherent riskiness in an inflationary environment of business investment, savers respond by saving less and by changing the form of their saving. While stock and bond prices ratchet up and down, the prices of housing, precious metals and works of art rise. Instead of saving in the form of stocks and bonds, savers make decisions to place their money in real estate, jewelry and other non-productive assets; decisions which inevitably contribute to the slowing of the growth rate of productivity and of GNP.

VI

EMPLOYMENT AND LABOR FORCE GROWTH

From 1948 to 1973 U.S. real GNP grew at an annual rate of 3.8 percent. Since 1973 the growth rate of real GNP has fallen to 2.5 percent. At the same time, employment growth has accelerated from 1.5 percent per year during the 1948-1973 period to 2.3 percent since 1973. With real output increasing during the earlier period much more rapidly than employment, output per employed worker rose at an average annual rate of 2.3 percent. The tides changed rather abruptly after 1973, however. With real output increasing at only 2.5 percent per year, and with employment rising at 2.3 percent per year, output per employed worker stayed roughly constant, meaning that the growth of real incomes -- as measured by the growth of output per employed worker -- dropped dramatically after 1973. This erosion of real income growth is one of the central features of the changing economic landscape.

As has been emphasized, the rapid expansion of employment relative to the capital stock is at the heart of the slow growth economy and the attendant declining real income growth problem. An appropriate policy direction is to find ways to increase investment in plant and equipment. Investment-enhancing policies will be increasingly important as the Nation moves into the 1980's. Alone among industrialized nations, the United States will, during the 1980's, experience the mixed advantages of a growing labor force whose annual growth rate will likely be in the range of 1.0 to 1.5 percent per year during the 1980's, and somewhat lower during the 1990's.

One beneficial effect will be the increase in the relative size of the productive age group 22 through 64. This group constituted just over 52 percent of the American population in 1978, and will rise to roughly 56 percent in 1990. Moreover, by 1990 the median age of Americans will be 33, compared to 30 in 1979.

By 1990, one-third of the population will be between the ages of 25 and 44. Households will be formed at the rate of 1.8 million per year -- an all-time high for the United States. The sheer weight of this demographic bulge, coupled with the growth of two-earner families and the rising number of single persons setting up households, will serve to increase the demand for housing, durable goods and services.

If the prime worker age group will be important in shaping future consumption patterns, it will be equally important in terms of its potential contribution to productivity. Typically, the 25-44 age group includes years of high productivity, when employees increase skills and work experience. The large number of prime age workers could, therefore, form the basis for a productivity renaissance -- provided the capital stock grows fast enough to accommodate them.

Accelerated economic growth -- in the sense of an increase in productivity or output per employed worker -- is essential not only to the well-being of the prime age worker group. It is absolutely essential if the Nation is to provide for its growing non-working population. The 65-plus population of the United States is currently growing at a rate twice that of the general population. By the year 2000, the U.S. population will have more than tripled during the century, but the segment of the population over age 65 will have increased ten-fold.

The increasingly rapid growth of the over-65 population must be considered in the context of an equally important development -- the decline in the fertility rate.

American women gave birth to half as many babies in the late 1970's as they did during the peak baby boom years in the late 1950's. At the crest of the baby boom (1946 through 1964), the fertility rate reached a high of almost 3.8 births per woman. During the 1970's the fertility rate fell to 1.8 births per woman; a rate that is below the replacement level of 2.1 and is the lowest in the Nation's history.

With fewer babies being born, the middle-aged segments of the population will continue to expand. After 2010, when the baby boom generation begins to retire, the elderly will cause the dependency ratio to worsen. There are now five persons of working age to each person over 65. The ratio could decline by 2030 to three working age persons for each person over 65. Yet it is the working age population whose taxes finance Social Security, Medicare and other Federal programs for the elderly -- programs which now account for one-fourth of the Federal Budget. * A particular concern is, of course, the Social Security system whose problems are discussed in the SSEC paper entitled "Social Security and Pensions: Programs of Equity and Security".

All of this suggests that investment-enhancing policies must be put in place. To deny America's growing labor force the tools that would enable it to realize its productive potential will not simply reduce potential economic growth. In human terms, it would jeopardize the Nation's ability to satisfy the growing claims on its output.

* A detailed discussion of the federal budget, and of the associated policy recommendations is provided in the SSEC paper entitled "Federal Finance: Government Dollars and American Affluence."

VII

THE NATURE OF THE INVESTMENT DECISION

Coaxing additional investment out of the system is no simple matter. Additional investment will occur when and only when: (a) the economic climate makes it sensible to invest, and (b) financing is available. The second condition requires that there be incentives to increase saving because investments do not occur if there is insufficient saving to finance them.

Regarding the first condition, businesses will invest only when they can reasonably anticipate earning a fair rate of return on their investment. And the calculation of the rate of return on any investment is based upon a comparison of two things: (a) the present value -- or the value today -- of anticipated future after-tax profits, and (b) the cost of making the investment.

Consider, for example, the problem of deciding whether to invest in a new piece of equipment. Whatever the purchase price of the equipment, this cost must be compared to the present value of the anticipated future profits that the equipment will contribute to the firm. The calculation of the present value of the profits that the equipment will generate depends upon three things: (a) a projection of the revenues the equipment will generate each year over its life; (b) a projection of the costs the firm will incur each year as a result of using the equipment, and (c) the selection of an interest rate by which to convert the future profits into present value terms.

Future profits (the difference between revenues earned and the costs incurred each year over the equipment's life) must be converted to present value because a dollar received tomorrow is not worth as much as a dollar received today. This is because a dollar received today can, for example, be placed in a savings account which pays interest. It is for this reason that a "discount" rate must be chosen; an interest rate reflecting the rate of return that could be earned if the firm had access to the future profits today rather than in the future.

Policies that increase projected revenues, or that decrease projected costs (or both) stimulate investment. By the same token, policies that reduce the interest rate used to convert future dollars into present value terms will also stimulate investment.

Policies that reduce the inflation rate are particularly helpful: A reduction in inflation that is accompanied by an increase in real incomes generally stimulates product demand, and therefore increases projected revenues. By the same token, reductions in the inflation rate generally reduce not only projected costs, but uncertainty as well. And, finally, reductions in the inflation rate pull interest rates down. In simplest terms, reductions in the inflation rate stimulate investment. Policies that reduce the inflation rate should therefore be accorded very high priority.

While anti-inflationary policies should receive high priority, policies that slow the rate of increase of energy prices should also receive particular attention. Energy price increases have imposed a significant burden on the economy. They have reduced consumers' real incomes, contributed to an erosion of businesses' cash flows and, equally important, they have slowed the rate of technological advance. Energy price increases have therefore reduced the rate of productivity growth, and have contributed both directly and indirectly to an erosion of real income growth.

As has been emphasized, the farming industry is energy-using, as are 24 of 29 manufacturing and non-farm, non-manufacturing industries. Technological change in each of these industries is heavily dependent upon energy use. As a result, in the vast majority of America's industries, increases in the relative price of energy slow the rate of adoption of technical advances. Energy price increases therefore reduce productivity growth.

Given the wide range of industries whose productivity growth depends upon energy-using technological change, policies that reduce the rate of increase of energy prices are imperative.

It would be foolhardy to suppose that policies could be put in place that would have the effect of reducing the relative price of energy. But policies can be implemented that encourage the efficient use of energy, and increase energy supply.

While they cannot by themselves "solve" the productivity problem, and while their contribution will not be instantaneous, programs to increase investment in plant and equipment, in human capital and in energy conservation and production are absolute prerequisites to increasing productivity growth. Increased investment can help to stabilize prices, stimulate output and real income growth, and improve the competitive posture of the U.S. economy.

VIII

THE ROLE OF TAX AND ENERGY POLICY

The goals of increased productivity and accelerated economic growth are interrelated. So must be the policy initiatives designed to foster their attainment.

Increased investment and saving are essential to productivity growth. And productivity growth is central to faster economic growth. Yet, reduced inflation is a prerequisite to these economic ends. The fulcrum of an anti-inflationary strategy must be an environment of policy stability -- a consistent trend toward slower monetary growth, a reduced share of government in GNP, and cost-effective regulatory initiatives.

What is required, above all, is a commitment to a reduction in inflation, and, in particular, to a reduction in the rate of increase of energy prices. None of this can be achieved by appeal to traditional "demand management" policies. The appropriate policy initiatives are supply side oriented.

A supply side strategy can take many forms. But a strong case can be made for the use of the tax system; to restructure the tax code so that individual initiative is encouraged, that productive effort is rewarded, and that the returns to saving and investment accrue to those who take the risks.

Tax policy must therefore play a central role. But an environment in which energy availability is always in question, and in which the cost of U.S. energy imports has risen 25-fold in 11 years, is hardly congenial to investment. If the Nation is ever to reach full stride -- if it is to return to anything like the growth path it experienced prior to the energy price revolution -- it must stand on two feet: (1) It must encourage investment and saving; (2) It must encourage domestic energy production and conservation.

The case for a supply side strategy is powerful. It can be made based upon *a priori* logic. But it can also be made by looking at the effects of hypothetical supply side policies on inflation, unemployment, real GNP growth, productivity, capital stock growth, and the share of investment in GNP, something which Data Resources Incorporated (DRI) has done in response to an SSEC question: What would it take to reduce the core inflation rate to less than 5 percent by 1990? (The core inflation rate, simply stated, is the difference between increases in wages and other costs of production, and increases in productivity.)

Three alternative policy scenarios were considered: *Case I, The Demand Management Case*, secured a reduction of the core inflation rate to 5 percent in 1990 by means of a very restrictive Federal budget policy; a policy which reduced Federal spending to 19.7 percent of GNP, down from the estimated 1980 share of 23.0 percent. Under this scenario, Federal spending increases at 0.5 percent per year in real terms. This spending pattern would be difficult to achieve if, for example, substantial increases in real military spending were sought.

The costs of this demand restraint policy would be felt in many ways. In effect, high unemployment rates and low utilization rates of industrial capacity would be relied upon gradually to reduce the core inflation rate. It is high unemployment that constitutes the intolerably high cost of following this policy option. Unemployment averages 8.9 percent in the first half of the decade, "improving" to 8.4 percent during the second half of the decade. The unemployment rates of nonwhite workers would, however, average 16.1 percent over the decade, with the unemployment rate for teenagers hovering around 19.8 percent.

In addition to high unemployment, a policy of demand restraint would reduce productivity growth still further. Because demand would be restrained and industrial capacity would be underutilized, little investment would occur. As a result, the increasing labor force would not be equipped with increasing amounts of physical capital, and productivity growth would be further restrained.

Case II, the Corporate Tax Incentive Case, uses supply side tax incentives to stimulate investment. The tax incentive policy option shortens the economic lives of equipment to 5.1 years, and of buildings to 10.2 years. In addition, the investment tax credit is increased to 22.8 percent.

As a result of the tax incentives, the share of investment in GNP rises to 11.7 percent over the first five years of the 1980's, and remains high at 11.0 percent for the rest of the decade. Capital stock then grows by 3.6 percent in the first half, and by 2.5 percent in the second half of the decade. Productivity growth averages 1.2 percent during the first half of the decade, and 1.4 percent during the second half. While this is an improvement over recent productivity performance, it is still low by postwar standards because, under this scenario, no additional efforts are undertaken to encourage domestic energy production and conservation. This prevents productivity from improving even more.

Most important, the use of tax incentives to encourage investment and productivity growth brings unemployment down during the first half of the decade to 7.8 percent, and to 7.3 percent during the second half. In addition, GNP grows at an average rate of 2.7 percent during the decade, which is more than half a point faster than its growth rate under the demand restraint scenario.

Case III combines the Corporate Tax Incentives of Case II with the added assumption that the Real Price Charged by OPEC is Constant over the Decade. Case III assumes that domestic energy price decontrol proceeds on schedule. It assumes, in addition, that natural gas and coal would be increasingly substituted for oil, that domestic energy production would be stimulated, and that energy conservation would be vigorously encouraged. In general, Case III assumes the legislated decontrol path of energy prices, and that the United States places stability of real world energy prices "higher on its priority lists." In effect, Case III assumes a determined effort to encourage both more efficient energy use and enhanced domestic energy production.

The results of stimulating investment generally, and energy investment in particular, are very positive: Unemployment is brought down to an average of 7.2 percent for the first half of the decade, and to 6.0 percent for the second half. The share of investment in GNP rises to an average level of 11.9 percent over the decade. The capital stock then grows at a 4.3 percent annual rate during the 1980-1985 period, and at a 3.3 percent rate during the last half of the decade. During both periods, the growth rate of the capital stock would be well in excess of the probable 1.0 to 1.5 percent annual growth rate of the labor force. Predictably, this results in an acceleration of productivity growth to 1.5 percent per year during the first half of the decade, and to 1.6 percent per year during the 1985-1990 period.

Finally, under the tax incentive, constant real energy price scenario, the annual growth rate of GNP climbs to 2.9 percent per year for the entire decade, well above the 2.5 percent rate experienced since 1973.

The study indicates, then, that "demand management" policies can squeeze out inflation, but they do so at terrible cost. Demand management secures a reduction in inflation at the cost of increased unemployment, slower economic growth, and slower productivity growth. Supply side strategies impose no such cost. Indeed, the tax incentives case achieves reduced inflation while at the same time stimulating growth of GNP, productivity and the capital stock. But the biggest bang for the buck comes from the simultaneous use of tax incentives and the encouragement of domestic energy production and conservation. Under this scenario the unemployment rate is lowest, real GNP and productivity growth are greatest, and the rate of increase of energy prices is slowest.

IX

THE ROLE OF HUMAN CAPITAL

Reductions in inflation, a more stable economic policy environment, a commitment to regulatory cost minimization, increased investment in plant, equipment and R&D, and a slower rate of increase of energy prices will stimulate productivity growth. But they cannot, by themselves, "solve" the productivity problem.

Machines are operated by human beings, bringing a people side to the productivity question. At a minimum, increased productivity is frequently viewed as a two-sided coin: All too often, management views an increase in productivity as simply an increase in output per worker hour. For its part, labor may only associate increased productivity with a deterioration of the quality of work; with an impingement upon its view of how a job should be done, and how a work day should be structured.

Given these differing interpretations, putting more physical capital in the hands of workers is the *first* step in increasing productivity and real income growth. Additional steps are essential.

First, there is a need for management, labor and government to recognize that increased productivity should work for the benefit of all three. Increased productivity does not simply translate to an increase in output per worker hour. It translates to an increase in real income -- provided wage gains reflect realized increases in productivity, and provided that the government does its job in reducing inflation. Management, labor and government must be partners in this three-pronged effort to increase productivity, increase real incomes and reduce inflation. Gains in money wages that are smaller than increases in productivity reduce workers' incentives to produce more. Too, gains in money wages that exceed productivity increases are inflationary. And gains in wages that reflect productivity gains, but that are less than the inflation rate, result in real income losses.

Second, it must be recognized that if cooperation among management, labor and government is essential to productivity growth, the relationship between management and labor is critical.* Productivity increases can, indeed, result in real income gains -- where the gains are measured in terms of what workers' incomes will buy. But the same productivity gains can result in a deterioration of the quality of work life. It is here that cooperation between management and labor plays a central role.

Increased productivity need not result in a deterioration of the quality of work life. Many plant floor innovations that have resulted in productivity increases have come about because of worker participation. Worker participation may take the form of so-called quality circles; it may take the form of something as simple as a suggestion box; it may involve participation in labor-management committees; or it may involve something as sophisticated as employee ownership of the sort contemplated by Employee Stock Ownership Trusts. Whatever its form, there must be understanding and commitment from both sides. Only then can worker participation make important contributions to rising productivity. Success will require a continuing cooperative spirit between management and labor that cannot come about as a result of government fiat. Management and labor, with the *encouragement* of government, must do it themselves.

The potential positive impact of worker participation appears great. A recent survey of worker attitudes conducted by the U.S. Chamber of Commerce and the Gallup Organization revealed that 84 percent of the workers interviewed would work harder and do a better job if they were able to participate in decisions affecting their jobs. Sixty-two percent of the respondents indicated that they spend time thinking about ways to improve the performance of their companies, and 65 percent feel that it is at least somewhat likely that any good ideas they have will be adopted. Of those surveyed, 67 percent affirmed that how hard they work and how well they do their jobs make a big difference in the competitive position of their companies. All of this suggests that workers are eager to participate and they recognize the potential contribution to productivity and competitiveness of cooperative labor-management efforts.

An environment of economic policy stability, of declining inflation, of cost-effective regulatory practices, of rising investment in R&D and in plant and equipment, and of management-labor-government cooperation will serve to promote productivity growth. However, progress also requires complementary growth in investment in human capital -- in the knowledge and skills of the Nation's labor force. Without expansion of worker skills, productivity and real income gains will be smaller than they might have been, and fewer of the objectives on the list of national priorities will be attainable.

---

* A more detailed discussion of the subject of labor-management cooperation can be found in the SSEC paper entitled "Human Resources and Demographics: Characteristics of People and Policy."

Education -- whether in the formal sense of classroom attendance, or in the sense of on-the-job training -- is the means by which investment in human capital occurs.

Education levels of American workers have risen considerably since World War II. Responding to favorable earnings prospects, an increasing proportion of young people completed high school and enrolled in college. College enrollment tripled, and the number of graduates nearly doubled during the 1950's and 1960's.

The result has been that the American labor force is the best educated and most productive in the world. But there have been problems. An over-supply of college graduates drove down the economic value of college education. In 1978 one out of four employed college graduates held jobs traditionally requiring less formal education.

The 1980's may, however, see an improvement in the returns to education, as relatively fewer workers compete for entry-level positions. Certain areas will experience shortages of skilled personnel. Chemical, mechanical and electrical engineers will be in particularly short supply, as will some physical scientists and others. On the other hand, a surge in the number of prime age workers (25-44 years of age) will result in a shortage of supervisory positions, and in an increasingly competitive job market for what are, potentially, America's most productive workers.

All of this suggests that new links must be forged among educational institutions, training programs and private employers and the government to improve the transition from school to the labor market. The future job market will require competency in basic skills and attention to increasingly complex job-related skills that enable employees to adapt to changing technology, employment patterns and job opportunities. Education will increasingly become a life-time pursuit in which the Nation has a very important stake. Rapidly changing technology and an equally rapidly changing pattern of employment will require flexibility.

While efforts are sustained to improve the skills of those who traditionally have easiest access to job markets, more must be done to reach and train those who historically are unemployed -- particularly young, disadvantaged minorities. Job training programs must be structured so that skills are taught which are most useful in the private growth sectors of the economy. The objective should be to place trainees in good paying jobs which have a future. This would contribute directly to the well-being of job trainees, and it would be one way to avoid labor shortages which slow the Nation's productivity growth rate.

X

POLICY RECOMMENDATIONS

If the United States is to regain its competitive edge, and if the standard of living is to be raised to preferred levels, productivity-enhancing policies must be developed and implemented as a part of a broad-based anti-inflationary program. Central to this effort must be commitment to reduce Federal Government expenditures as a percent of GNP, and gradually to reduce the growth rate of the money supply. Success in these efforts would help prevent a displacement by government of private capital spending, and would have the beneficial effect of stabilizing interest rates. Such an economic environment is congenial to saving, to investment, and to economic growth, and it contributes directly to the development of the cooperative, unified efforts -- rather than adversarial tendencies -- needed to face America's challenges.

This staff study helps to document the critical role of capital formation in the productivity process. To accumulate physical capital more rapidly requires policies that encourage both investment and saving, with special emphasis on investment in energy conservation and production. It also requires policies which improve the development and use of high technology, which occurs as a result of research and development efforts.

Technological change is not embodied solely in plant and equipment. Human capital is an essential part of the economic growth process. In view of the continuing growth of the labor force, efforts must be undertaken to ensure that its productive potential is fully realized.

Policies also must focus on a better balance of social and economic goals, especially regarding regulation. While the benefits of regulation are obvious, these benefits must be balanced against their costs. In general, the problem has been that insufficient attention has centered on cost-effective regulatory implementation. Both economic and social goals suffer when pollution or other standards are not satisfied in the most cost-effective way, because resources are used that might otherwise have been employed elsewhere -- including the attainment of other regulatory goals.

Any increase in the efficient use of productive resources necessarily results in an increase in productivity, and in a concommitant reduction either in the rate of increase of costs, or in an actual reduction of costs. Cost-effective regulatory implementation is therefore in everyone's interest.

With these objectives in mind, recommendations are:

A. To Encourage Investment and Saving:

1. Businesses should be permitted faster tax writeoffs on plant and equipment. Tax writeoffs should, as nearly as is administratively possible, approach current replacement costs.
2. To encourage saving, tax rates on dividend and interest income and on capital gains should be reduced.

B. To Encourage Energy Conservation and Domestic Energy Production:

1. The phased decontrol of oil should remain on schedule, and the decontrol of natural gas should be accelerated.
2. Up to 40 billion barrels of oil in the United States that are not presently recoverable could be produced with enhanced recovery techniques. Because present technologies are so expensive, and because technological improvements are still on the horizon, Federal research into enhanced recovery should be accelerated.
3. As the real prices of oil and natural gas rise, the production of synthetic fuels will become more economic. The Federal Government should encourage this process by sharing in the risks attendant to synthetic fuels production. The Federal Government should establish a program of purchase and price guarantees for synthetic fuels production. The Energy Security Act is a step in the right direction.
4. In general, the Federal Government should encourage the use of a broad range of energy sources.

C. To Encourage Access to Alternative International Energy Sources:

1. Conversion from insecure to secure energy sources should be a goal of Federal policy.
2. The United States should encourage oil and natural gas exploration in the less developed countries.*

---

* A more detailed discussion of the energy problem, and of the associated policy recommendations is provided in the SSEC paper entitled "Energy and Materials: A Shortage of Resources or Commitment?"

D. To Encourage Cost-Effective Regulatory Initiatives:

1. Congress should pass legislation establishing a regulatory budget. A regulatory budget would impose absolute limits for a given time period on the compliance costs that the executive branch could impose, through regulation, on the private sector or on governmental units. The purpose of the regulatory budget would be to encourage cost-effective implementation of regulatory mandates, and to enable the Congress and other interested parties to gain a more comprehensive view of the Federal Government's command over resources. The regulatory budget would be a logical extension of the fiscal budget.

2. Environmental, health and safety regulations should be implemented on the basis of performance rather than design standards.

3. For price regulated industries, such as public utilities, permissible rates of return should be based on current rather than historical costs.*

E. To Encourage Research and Development Efforts:

1. The investment tax credit should be expanded to include R&D expenditures, and to allow additional credit for investment in R&D structures and equipment.

2. More favorable tax treatment should be accorded to contributions made by individuals and corporations to research-oriented activities.

3. Capital gains from the sale of venture capital stock should be made exempt from taxation, provided the gains are reinvested in new, small, R&D-oriented businesses.**

F. To Encourage Investment in Human Capital:

1. The Federal Government should encourage the development of programs: (a) to reduce illiteracy; (b) that contemplate the structuring of college programs that prepare

---

* A more detailed discussion of regulation, and of the associated policy recommendations is provided in the SSEC paper entitled "Government Regulation: Achieving Social and Economic Balance."

** A more detailed discussion of research and development, and of the associated policy recommendations is provided in the SSEC paper entitled "Research and Innovation: Developing a Dynamic Nation."

students for entry into the labor market, and for multiple careers during a lifetime; (c) to provide vocational training which matches skills and training to the needs of the workworld.

2. The Federal Government should continue its efforts to end discrimination. Discrimination reduces potential output by hampering employment opportunities of minorities, of women, and of handicapped and older workers.*

Finally, it is clear that the Federal Government must shoulder its share of responsibilities, as set out in this staff study, in the battle to revitalize productivity growth. But it is the private sector that must confront the problem of adversarial relationships between management and labor; a recognized contributor to the erosion of productivity growth.

The available evidence here and abroad suggests strongly that joint labor-management committees can identify opportunities for productivity gains, and that this can lead to significant improvement in worker morale.

An effective, thorough-going and long-lasting commitment on the part of the Federal Government to the provision of an environment that is congenial to long-term economic growth could, in turn, encourage more cooperation between labor and management. If that is the result, then the attack on declining productivity will have fostered a timely partnership of labor, management *and* government; a partnership that can usher in a new era of American economic strategy.

---

* A more detailed discussion of human capital, and of the associated policy recommendations is provided in the SSEC paper entitled "Human Resources and Demographics: Characteristics of People and Policy."

Authors of Selections

GREGORY B. CHRISTAINSEN, *University of Wisconsin-Madison*
ROBERT H. HAVEMAN, *University of Wisconsin-Madison*
C. JACKSON GRAYSON, Jr., *Chairman, American Productivity Center*
L. DOUGLAS LEE, *Data Resources, Inc.*
JAMES L. McINTIRE, *Senate Committee on Labor and Human Resources*
JULIUS W. ALLEN, *Consultant to the Economics Division, Congressional Research Service*
VIJAYA G. DUGGAL, *et. al., Wharton EFA, Inc.*
OTTO ECKSTEIN, *President, Data Resources, Inc.*

Participants on SSEC Hearing Panels

EDWARD F. DENISON, *U.S. Department of Commerce*
MICHAEL K. EVANS, *President, Evans Economics, Inc.*
SOLOMON FABRICANT, *Professor Emeritus, New York University*
JOHN W. KENDRICK, *Professor of Economics, George Washington University*
JEROME A. MARK, *Assistant Commissioner, Office of Productivity and Technology, Bureau of Labor Statistics, Department of Labor*
GEORGE H. KUPER, *Executive Director, National Center for Productivity and Quality of Working Life*
JEROME M. ROSOW, President, *Work in America Institute, Inc., Scarsdale, N.Y.*

Contributors of Peer Reviews

EWAN CLAGUE, *formerly Commissioner of Labor Statistics, U.S. Department of Labor*
ROBERT HAVEMAN, *University of Wisconsin-Madison*
DALE W. JORGENSON, *Harvard University*
J.R. NORSWORTHY, *Chief of Productivity Section, Bureau of Labor Statistics, U.S. Department of Labor*

The Productivity section of the Special Study on Economic Change is one of 10 sections of the SSEC. Final printing will include all areas of the special study. Orders for this Productivity study may be placed by contacting:

Joint Economic Committee
Room G-133
Dirksen Senate Office Building
Washington, D.C. 20510
Telephone: (202) 224-5321

○